

Software manual

# TOX<sup>®</sup> Process Monitoring

EPW 600



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# 1 Important information

## 1.1 Legal note

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Operating instructions, manuals, technical descriptions and software are originally compiled in German.

## 1.2 Exclusion of liability

TOX® PRESSOTECHNIK has checked the contents of this publication to ensure that it conforms to the technical properties and specifications of the products or plant and the description of the software. However, discrepancies may still be present, so we cannot guarantee complete accuracy. The supplier documentation included with the system documentation is an exception.

However, the information in this publication is checked regularly and any required corrections are included in subsequent editions. We are grateful for any corrections and suggestions for improvement. TOX® PRESSOTECHNIK reserves the right to revise the technical specifications of the products or plant and/or the software or documentation without prior notice.

## 1.3 Conformity

The product is compliant with EU guidelines.

See separate Declaration of conformity or installation declaration.

## 1.4 Validity of the document

### 1.4.1 Content and target group

This manual contains information and instructions for the configuration and administration of the software, as well as for safe operation and safe maintenance or servicing of the product.

This software manual describes the general configuration options of the software. Due to customer-specific settings and the assignment of rights, the display of the screens may differ.

- All information in this manual is up to date at the time of print. TOX® PRESSOTECHNIK reserves the right to make changes that improve the system or increase the standard of safety.
- The information is intended for:
  - the operator
  - the administration and setup personnel
  - the service personnel
  - the operating personnel (with restrictions by the assignment of rights)

### 1.4.2 Other applicable documents

In addition to the available manual, further documents can be supplied. These documents must also be complied with. Other applicable documents can be, for example:

- additional operating manuals (e.g. of components or of a whole system)
- Supplier documentation
- Instructions, such as software manual, etc.
- Technical data sheets
- Safety data sheets
- Data sheets
- Schematics

### 1.4.3 Screenshots and application examples

All screenshots in this documentation are application examples. The screenshots in this documentation can, depending on the software version, deviate from the screen display.

## 1.5 Gender note

In order to enhance readability, references to persons that also relate to all sexes are normally only stated in the usual form in German or in the corresponding translated language in this manual, thus e.g. "operator" (singular) for male or female, or "operators" (plural) for male or female". This should in no way convey any gender discrimination or any violation of the principle of equality, however.

## 1.6 Displays in the document

### 1.6.1 Display of warnings

Warning signs indicate potential dangers and describe protective measures. Warning signs precede the instructions for which they are applicable.

#### Warning signs concerning personal injuries

---

** DANGER****Identifies an immediate danger!**

Death or severe injuries will occur if appropriate safety measures are not taken.

→ Measures for remedial action and protection.

---

---

** WARNING****Identifies a potentially dangerous situation!**

Death or serious injury may occur if appropriate safety measures are not taken.

→ Measures for remedial action and protection.

---

---

** CAUTION****Identifies a potentially dangerous situation!**

Injury may occur if appropriate safety measures are not taken.

→ Measures for remedial action and protection.

---

## Warning signs indicating potential damage

### NOTE

#### Identifies a potentially dangerous situation!

Property damage may occur if appropriate safety measures are not taken.

→ Measures for remedial action and protection.

### 1.6.2 Display of general notes

General notes show information on the product or the described action steps.



Identifies important information and tips for users.

### 1.6.3 Highlighting of texts and images

The highlighting of texts facilitates orientation in the document.

✓ Identifies prerequisites that must be followed.

1. Action step 1

2. Action step 2: identifies an action step in an operating sequence that must be followed to ensure trouble-free operation.

▷ Identifies the result of an action.

▶ Identifies the result of a complete action.

→ Identifies a single action step or several action steps that are not in an operating sequence.

The highlighting of operating elements and software objects in texts facilitates distinction and orientation.

- <In square brackets> identifies operating elements, such as buttons, levers and (valves) stopcocks.
- "with quotation marks" identifies software display panels, such as windows, messages, display panels and values.
- **In bold** identifies software buttons, such as buttons, sliders, checkboxes and menus.
- **In bold** identifies input fields for entering text and/or numerical values.

## 1.7 Contact and source of supply

Only use original spare parts or spare parts approved by TOX® PRESSOTECHNIK.

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For additional information and forms see [www.tox.com](http://www.tox.com)

## 2 Safety

### 2.1 Basic safety requirements

The product is state of the art. However, operation of the product may involve danger to life and limb for the user or third parties or damage to the plant and other property.

For this reason the following basic safety requirements will apply:

- Read the operating manual and observe all safety requirements and warnings.
- Operate the product only as specified and only if it is in perfect technical condition.
- Remedy any faults in the product or the plant immediately.

### 2.2 Organizational measures

#### 2.2.1 Safety requirements for the operating company

The operating company is responsible for compliance with the following safety requirements:

- The operating manual must always be kept available at the operation site of the product. Ensure that the information is always complete and in legible form.
- In addition to the operating manual, the generally valid legal and other binding rules and regulations must be provided for the following content and all personnel must be trained accordingly:
  - Work safety
  - Accident prevention
  - Working with hazardous substances
  - First aid
  - Environmental protection
  - Traffic safety
  - Hygiene
- The requirements and contents of the operating manual must be supplemented by existing national regulations (e.g. for prevention of accidents and for environmental protection).
- Instructions for special operating features (e.g. work organization, work processes, appointed personnel) and supervisory and reporting obligations must be added to the operating manual.

- Take action to ensure safe operation and make sure that the product is maintained in a functional condition.
- Only allow authorized persons access to the product.
- Ensure that all personnel work with awareness of safety and potential dangers with reference to the information in the operating manual.
- Provide personal protective equipment.
- Maintain all safety and information on dangers regarding the product complete and in legible condition and replace as required.
- Do not make any changes, carry out attachments or conversions to the product without the written approval of TOX® PRESSOTECHNIK. Action contrary to the above will not be covered by the warranty or the operating approval.
- Make sure that the annual safety inspections are carried out and documented by an expert.

### **2.2.2 Selection and qualifications of personnel**

The following safety requirements are applicable for the selection and qualifications of personnel:

- Only appoint persons to work on the plant who have read and understood the operating manual, and in particular, the safety instructions before starting work. This is particularly important for persons who only work on the plant occasionally, e.g. for maintenance work.
- Only allow persons appointed and authorized for this work access to the plant.
- Only appoint reliable and trained or instructed personnel.
- Only appoint persons to work in the danger zone of the plant who can perceive and understand visual and acoustic indications of danger (e.g. visual and acoustic signals).
- Ensure that assembly and installation work and the initial commissioning are performed exclusively by qualified personnel who have been trained and authorized by TOX® PRESSOTECHNIK.
- Maintenance and repairs must be performed by qualified and trained personnel only.
- Ensure that personnel who are being trained, instructed or are in an apprenticeship can only work on the plant under the supervision of an experienced person.
- Have work on electrical equipment performed only by electricians or trained persons under the direction and supervision of an electrician in accordance with the electrotechnical regulations.

## 2.3 Fundamental hazard potential

Fundamental hazard potentials exist. The specified examples draw attention to known hazardous situations, but are not complete and do not in any way provide safety and risk awareness action in all situations.

### 2.3.1 Electrical hazards

Attention should be paid to electrical hazards particularly inside the components in the area of all assemblies of the control system and motors of the installation.

The following basically applies:

- Have work on electrical equipment performed only by electricians or trained persons under the direction and supervision of an electrician in accordance with the electrotechnical regulations.
- Always keep the control box and/or terminal box closed.
- Before commencing work on electrical equipment, switch off the main switch of the system and secure it against being switched back on inadvertently.
- Pay attention to the dissipation of residual energy from the control system of the servomotors.
- Make sure that the components are disconnected from the power supply when carrying out the work.

## 3 About this product

### 3.1 Intended use

The process monitoring ensures constant monitoring of the production process and quality assurance during production.

#### 3.1.1 Safe and correct operation

Intended use includes the following conduct:

- Only operate with the components for which it is specified.
- Follow all instructions in this operating manual.
- Comply with the specified maintenance intervals and perform maintenance work correctly.
- Operate in compliance with the conditions of the technical data.
- Operation with fully assembled and functional safety devices.
- Activities may only be carried out by persons who are qualified or authorized for this purpose.

Any other use or application beyond this does not come under the scope of intended use.

#### 3.1.2 Foreseeable misuse

Use contrary to intended use includes the following foreseeable misuse:

- Operation under conditions that deviate from the technical data.
- Operation without fully assembled and functional connections.
- Operation without fully assembled and functional safety devices.
- Modifications to the product without prior approval by TOX® PRESSOTECHNIK and the approving authority.
- Incorrect parameterization.
- Execution of activities by persons who are not qualified or authorized to do so.

The operating company is exclusively responsible for all personal injury and property damage resulting from non-intended use. Non-intended use will not be covered by the warranty or the operating approval.

## **3.2 Product identification**

### **3.2.1 Type plate**

The details on the type plate ensure clear identification of components and the specific operating parameters.

The type plate is attached permanently on the component.

## **3.3 Function description**

### **3.3.1 Process monitoring system**

The pressing monitor monitors processes, in which precisely defined functional correlations between force and distance have to be verified.

The device reads the force/distance data pairs from two measuring channels <X> and <Y> during the measuring operation. The data are written to memory and can be displayed graphically. The resulting force/distance function is compared with the specified data limits of the set window values or envelope curve. An OK message is issued if the data limits are complied with, otherwise a NOK message is issued.

## 4 Technical data

### 4.1 Data sheet

For technical data see data sheet.  
www.tox.com

### 4.2 General technical data

#### 4.2.1 Mechanical characteristics

Description of EPW600 Installation Version	Value
Plastic installation housing	PA66 CF25, RAL 9000, UL 94-H
Installation cutout (Q x H)	198 mm x 122 mm
Display	7" or 10.1" TFT LCD WSVGA (1024 x 600) LED-Backlight
Touch-technology	PCAP, projective capacitive touch 2-point multitouch
Plastic front frame	PA66 CF25, RAL 9000, UL 94-H
Fastening type	Clamp mounting via fixing element
Type of protection according to DIN 60529 09/2014	IP 65 (front plate) IP 20 (housing)
Weight	7" 575 g 10.1" 910 g

Description of EPW600 Wall Version	Value
Wall-mounted housing	Stainless steel
Installation cutout (W x H x D)	268 mm x 175 mm x 107.6 mm
Display	10.1" TFT LCD WSVGA (1024 x 600) LED-Backlight
Touch-technology	PCAP, projective capacitive touch 2-point multitouch
Plastic front frame	PA66 CF25, RAL 9000, UL 94-H
Fastening type	4 x M6 screws
Type of protection according to DIN 60529 09/2014	IP 65 (front plate) IP 20 (housing)
Weight	10.1": 2,500 g

#### 4.2.2 Power supply

Description	Value
Input voltage	24 V DC 9 - 36 V wide range input
Current consumption	≤ 1.5 A
Wall-mounted housing	24 V DC (M12 multipoint connector)

#### 4.2.3 Hardware configuration

Description	Value
Processor	ARM®Cortex® A7 2x 1 GHz
Memory	512 MB DDR3 RAM 512 MB NAND Flash 256 Kb NVRAM / NRAM
Real time clock / accuracy rate	at 25°C: ≤ +/- 1 s/ day, at - 10 ... + 70°C: ≤ + 1 s ... - 11 s/ day
Display	TFT LCD WSVGA (1024 x 600) Backlighting LED, switchable via software Contrast 600:1 (7"); 800:1 (10.1") Luminosity cd/m <sup>2</sup> : Type 400 (7"); type 430 (10.1") Viewing angle vertical 160°, horizontal 130° Capacitive, color depth 18 bit
Extendibility of interfaces	1 x slot for communication module Anybus CompactCom CC40 1 x micro SD card (microSDHC, up to 32 GB)

#### 4.2.4 Connections

Description	Value
Digital inputs	16
Digital outputs	8
Analog inputs	2
Analog outputs	2
Ethernet interface 10/100 Mbit/s	1
Ethernet interface 1 Gbit/s	1
DM inputs	2
USB device	2
Micro SD card	1
Communication module Anybus Compact-Com CC40	1

See circuit diagram for definition of the interfaces.

### Digital inputs

Description	Value
Input voltage	24 V
Input current	At rated voltage (24 V): 4.8 mA
Delay time of standard inputs	$t_{\text{LOW-HIGH}}$ : 2 $\mu\text{s}$ $t_{\text{HIGH-LOW}}$ : 2 $\mu\text{s}$
Input voltage	LOW level: $\leq 5$ V HIGH level: $\geq 15$ V
Input impedance	4.3 k $\Omega$

### Digital inputs/outputs

Description	Value
Load voltage $V_{\text{in}}$	Nominal value 24 V (admissible range 19.2 to 30 V)
Output voltage	HIGH level: min. $V_{\text{in}} - 0.07$ V LOW level: max. $5 \mu\text{A} \cdot R_{\text{load}}$
Output current	max. 0.5 A DC
Parallel switching of outputs possible	max. 4 outputs
Lamp load	max. 6 W
Coincidence factor	100 %

### Analog inputs

Description	Value
Quantity	2 x voltage
Input size	dependent on pinning
Voltage range	0-10 V
AD conversion	ADC
Principle	successive approximation
Resolution	16 bit
Conversion time	7 $\mu\text{s}$
max. input range	
Voltage range	15 V
Current range	25 mA
Input impedance	25 k $\Omega$
Offset error (0-point)	$\leq \pm 30$ mV
Reinforcement error	$\pm 1$ %
Sensor supply (output)	24 V DC, max. 50 mA

Tab. 1 Analog inputs, non-isolated

### Analog outputs

Description	Value
Quantity	2
Output size Voltage range	Voltage 0-10 V
DA conversion Principle Resolution Load Conversion time Limit frequency	R2R 16 bit max. 5 mA ≤ 100 µs ca. 5 kHz
Offset error (0-point)	≤ +/- 30 mV
Reinforcement error	+/- 0.5%

Tab. 2 Analog outputs non-isolated

### Strain gauge inputs (DMS)

Force measurement (channel Y) via strain gauge force transducer. The input is selected in the "Settings\Configuration force sensor" menu (see Configuring the force sensor).

Description	Value
Quantity	2
Input size voltage range	Adjustable via software 1 mV/V, 2 mV/V, 4 mV/V, 8 mV/V userdefined (max. 8 mV/V) +/-1 mV/V, +/-2 mV/V, +/-4 mV/V, +/-8 mV/V userdefined (max. +/-8 mV/V) corresponds to 5 V supply voltage 5 mV, 10 mV, 20 mV, 40 mV, +/-5 mV/V, +/-10 mV/V, +/-20 mV/V, +/-40 mV/V,
AD conversion Principle Resolution Conversion time	Delta-Sigma +/- 15 bit / 16 bit (internal 24 bit) Adjustable via software 256 µs (3906 Sps [= Samples per second]) 512 µs (1953 Sps) 1024 µs (977 Sps) 2048 µs (488 Sps) 4096 µs (244 Sps) All channels are converted simultaneously
max. input range of voltage	+1.6 V ...+3.4 V
Input impedance	1.75 MΩ

Description	Value
Minimum bridge resistance DMS	87 $\Omega$
Sensor supply per channel	5 V DC +/- 5%, max. 60 mA, short-circuit proof

Tab. 3 Strain gauge inputs, non-isolated, 6-conductor

## USB

Description	Value
Number of channels	2 x host (full speed)
USB 2.0	According to USB device Specification of USB 2.0 Compatible type A and B
Cable length	Max. 5 mm

Pin	Value
1	+5 V
2	Data -
3	Data +
4	GND

## Ethernet

Description		Value
Ethernet 10/100 Mbit/s Ethernet	Number of channels	1 channel, twisted pair (10/100BASE-T)
	Transmission according to	IEEE/ANSI 802.3, ISO 8802-3, IEEE802.3u
	Transmission rate	10/100 Mbit/s
	Connecting line	Shielded
	Length	Max. 100 mm
	Cable	Shielded impedance 100 $\Omega$
	Connector	RJ45
	LED status display	Yellow: active Green: link
Ethernet 1 Gbit/s EtherCat	Number of channels	1 channel, twisted pair (1 Gbit BASE-T)
	Transmission according to	IEEE/ANSI 802.3, ISO 8802-3, IEEE802.3u
	Transmission rate	1 Gbit/s
	Connecting line	Shielded at least CAT 5
	Length	Max. 100 mm
	Cable	Shielded impedance 100 $\Omega$
	Connector	RJ45 (modular connector)
	LED status display	Yellow: active Green: link

## Anybus module

Description	Value
Industrial Ethernet	EtherCAT EtherNet IP PROFINET
Logic supply Rated voltage Permissible range Current consumption from 24 V	24 V DC 9 - 36 V DC wide range input ≤ 1 A
Anybus supply Rated voltage Permissible range Current consumption from 24 V	24 V DC 9 - 36 V DC wide range input ≤ 1 A

### 4.2.5 Environmental conditions

Description	Value
Temperature	Operation +5°C - +55°C Storage -25°C - +70°C
Relative humidity without condensation acc. to RH2	10 % - 95 %
Vibrations according to IEC 68-2-6	5 Hz - 8.4 Hz Amplitude 1.75 mm, 8.4 Hz 150 Hz Acceleration 0.5 g

### 4.2.6 Electromagnetic compatibility

Description	Value
Noise immunity	DIN EN 6131-2 04/2008 DIN EN 61000-6-2 03/2006
Electrostatic discharge according to EN 61000-4-2	Contact +/- 4 kV Air gap +/- 8 kV
Electromagnetic fields according to EN 61000-4-3	80 MHz - 1 GHz: 10 V/m 80% AM (1 kHz) 1.4 GHz - 2 GHz: 3 V/m 80% AM (1 kHz) 2.0 GHz - 2.7 GHz: 1 V/m 80% AM (1 kHz)
Fast transients according to EN 61000-4-4	DC network inputs/outputs +/- 2 kV Signal ports +/- 1 kV
Asymmetric high frequency according to EN 61000-4-6	0.15 - 80 MHz 10 V 80% AM (1 kHz)
Impulse voltage according to EN 61000-4-5	Asymmetric and symmetric +/- 0.5 kV
RFI emissions According to DIN EN 61131-2 04/2008 and DIN EN 61000-6-4 09/2011 30 MHz - 1 GHz	IEC/CISPR 16-2-3  40 / 47 dB (µV/m)

**NOTE**

**Adherence to EMC/EC directive**

For adherence to the EMC / CE directives, a proper total setup corresponding to the user manual smart9 1000 /eco9 1000 is assumed.

For the electromagnetic compatibility of the total system into which the control system is integrated, the one who introduces the entire plant into circulation bears the responsibility. We reserve the right to make technical changes for the improvement of quality.

**4.3 Overview of installation version**

**4.3.1 Installation version connections**

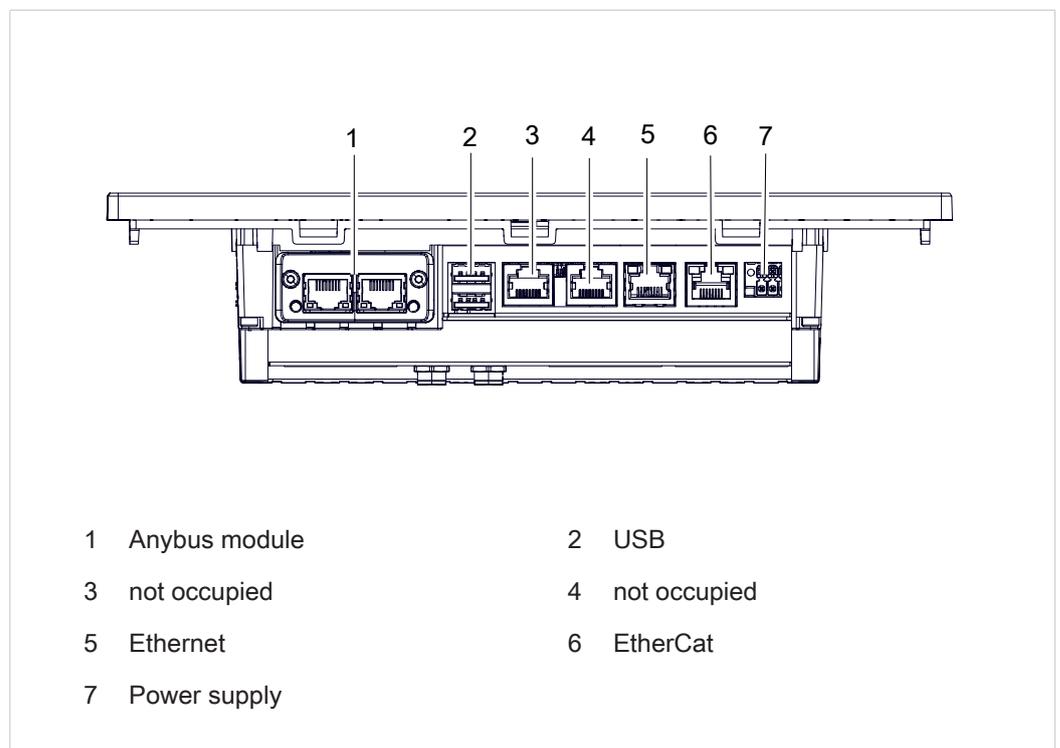


Fig. 1 Installation version: connections to underside

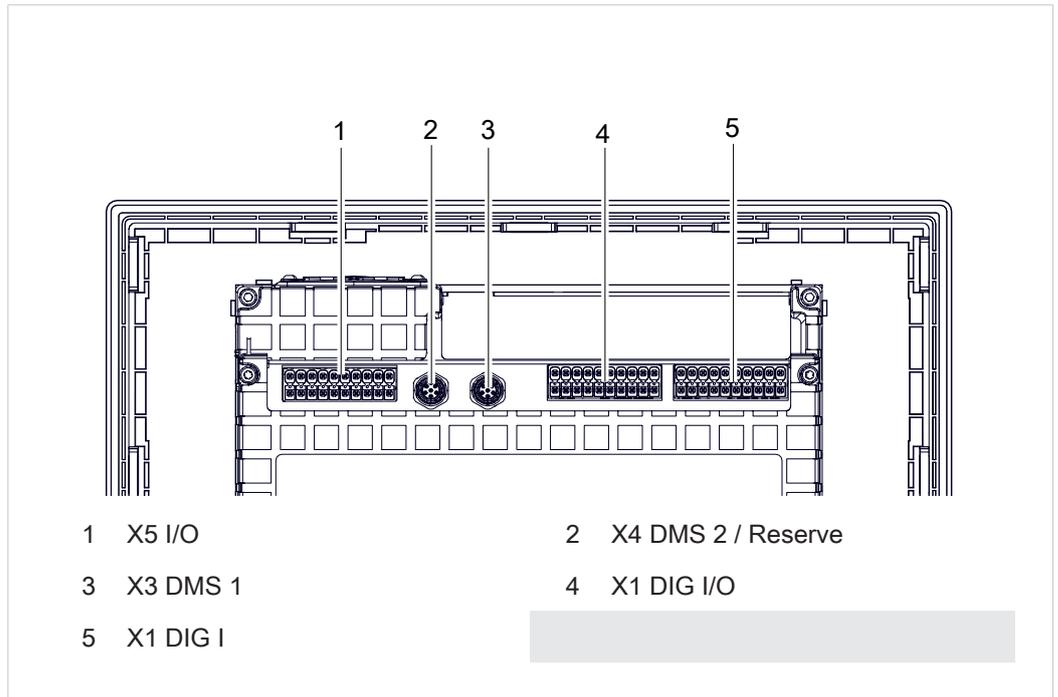


Fig. 2 Installation version: connections to rear side

### 4.3.2 Installation version pin assignment

Pin	Designation
1	0 V Anybus
2	0 V
3	PE
4	PE
5	24 V Anybus
6	24 V

### 4.3.3 Digital inputs installation version (X1 DIG E)

Pin	OK	Designation
18	I 1	Program bit 0
16	I 2	Program bit 1
14	I 3	Program bit 2
12	I 4	Program bit 3
10	I 5	Program bit 4
8	I 6	Program bit 5
6	I 7	Program strobe
4	I 8	Offset external
1	GND_DIO	0 V external
17	I 9	Measurement start
15	I 10	Piece part is finished
13	I 11	External operating mode

Pin	OK	Designation
11	I 12	Error reset
9	I 13	Reserve
7	I 14	Access level bit 0
5	I 15	Access level bit 1
3	I 16	Reserve
20	DI_1-16_24V	Sensor supply

Tab. 4 Phoenix Contact DFMC 20 connections

#### 4.3.4 Digital outputs installation version (X2 DIG I/O)

Pin	OK	Designation
18	O 1	OK
16	O 2	NOK
14	O 3	NOK alarm
12	O 4	Switching point S1
10	O 5	Switching point S2
8	O 6	Ready for measurement
6	O 7	Program ACK
4	O 8	Switching point S3
1	GND_O	0 V external
20	+24 V	24 V external

Tab. 5 Phoenix Contact DFMC 20 connections

#### 4.3.5 Installation version connector assignment strain gauge (DMS) force transducer (X3 DMS1)

Pin	DMS signal
1	Supply DMS V-
2	Supply DMS V+
3	Sensor cable DMS F+
4	Measuring signal DMS +
5	Measuring signal DMS -
6	Sensor cable DMS F-
S	Shield

Tab. 6 M8 x 1 bushing 6-pin X3 for DMS sensors

**i** For hardware model EPW 600.022.0X (2-channel) the DMS 2 X4 is reserved for channel pair 2 X/Y!

The connections are occupied the same as for the first card.

**Channel Y DMS Force Transducer X3 DMS 1**

Connection example of DMS1 without sensor cable (CKN / ZAK / ZPS)

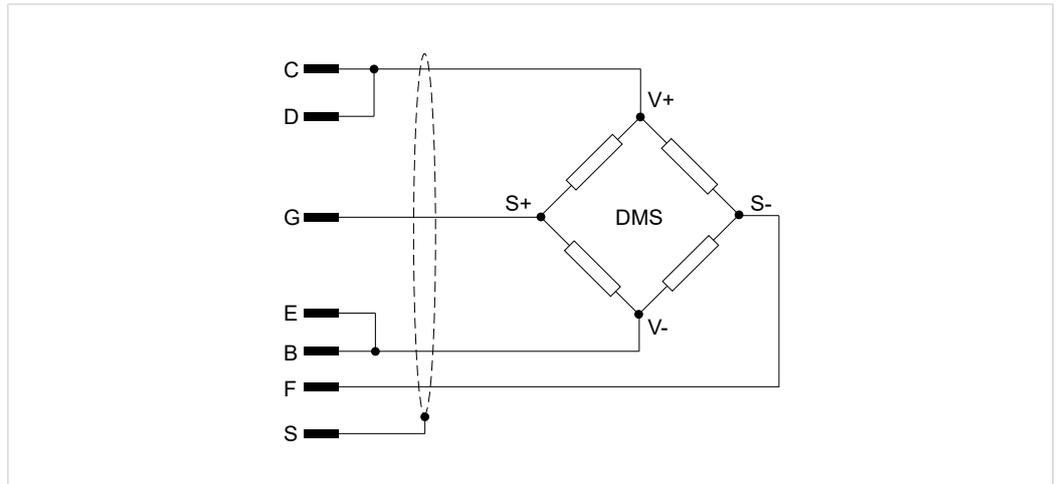


Fig. 3 Connection example bushing M8x1 6-pin

For connection of the DMS with 4-cable technology, pin 2 and 3 as well as pin 6 and pin 1 are bridged.

Connection example of DMS1 with sensor cable

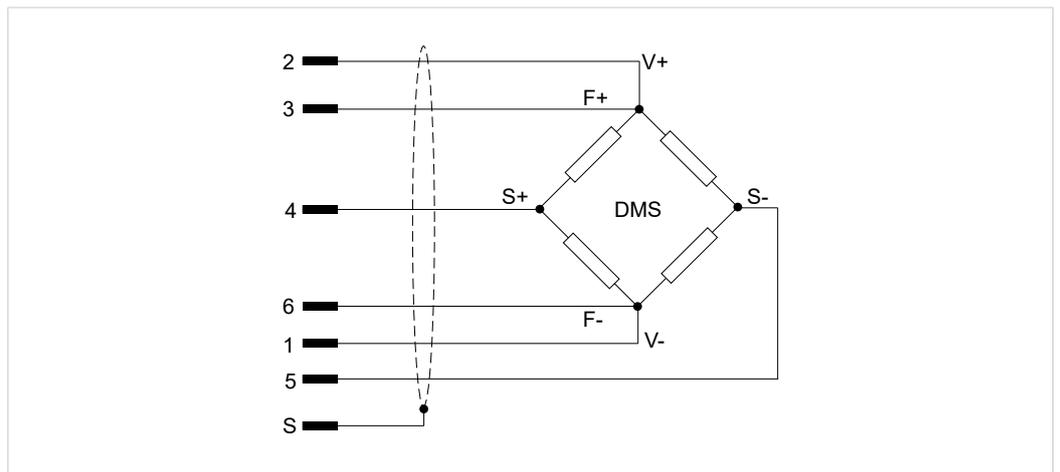


Fig. 4 Connection example bushing M8x1 6-pin

### 4.3.6 Installation version connector assignment analog signals (X5 I/O) (channel Y force / channel X distance) for analog standard signals

Pin	Type X5 Input/Output	Analog signal
1		GND
2		GND
3	AI-2 I	
4	AO-2	Analog output 2: 0 - 10 V process-dependent / force / distance <sup>2</sup>
5	AI-2 U	
6	AO-1	Analog output 1: Tare +10 V <sup>2</sup>
7	AI-1 I	
8		GND
9	AI-1 U	Force signal 0 - 10 V, channel Y analog
10		GND
11	O	+10 V sensor supply
19	O	+24 V sensor supply
20	O	+24 V sensor supply

Tab. 7 <sup>2</sup> Output function configurable

The connections are occupied the same as for the first card.

#### Connection example X5: Channel Y force transducer analog

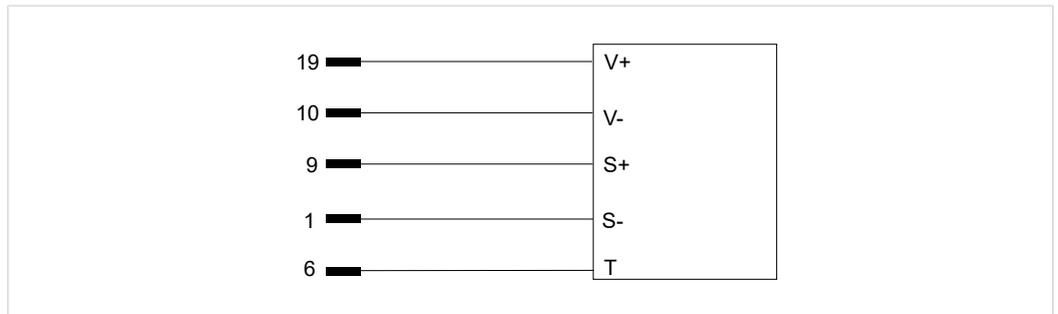


Fig. 5 Connection example of sensor with standard signal 0 - 10 V (ZKN with tare)

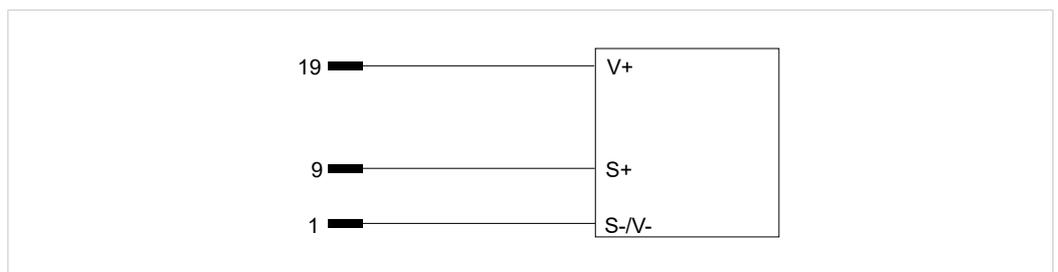


Fig. 6 Connection example ZDO 24 V supply voltage

Channel X distance transducer

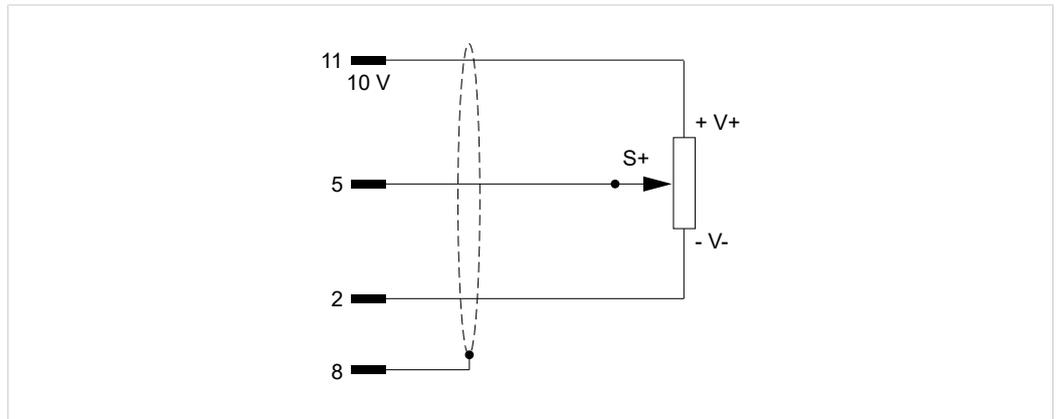


Fig. 7 Connection example of distance potentiometer (ZWW 10 V supply voltage)

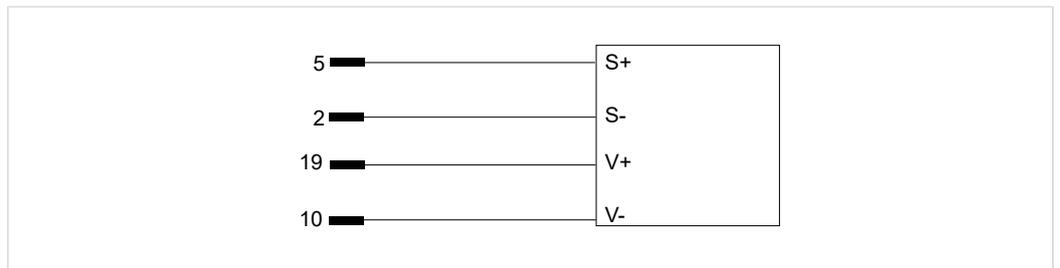


Fig. 8 Connection example of distance transducer (ZKW 24 V supply voltage)

## 4.4 Overview of wall version

### 4.4.1 Wall version connections

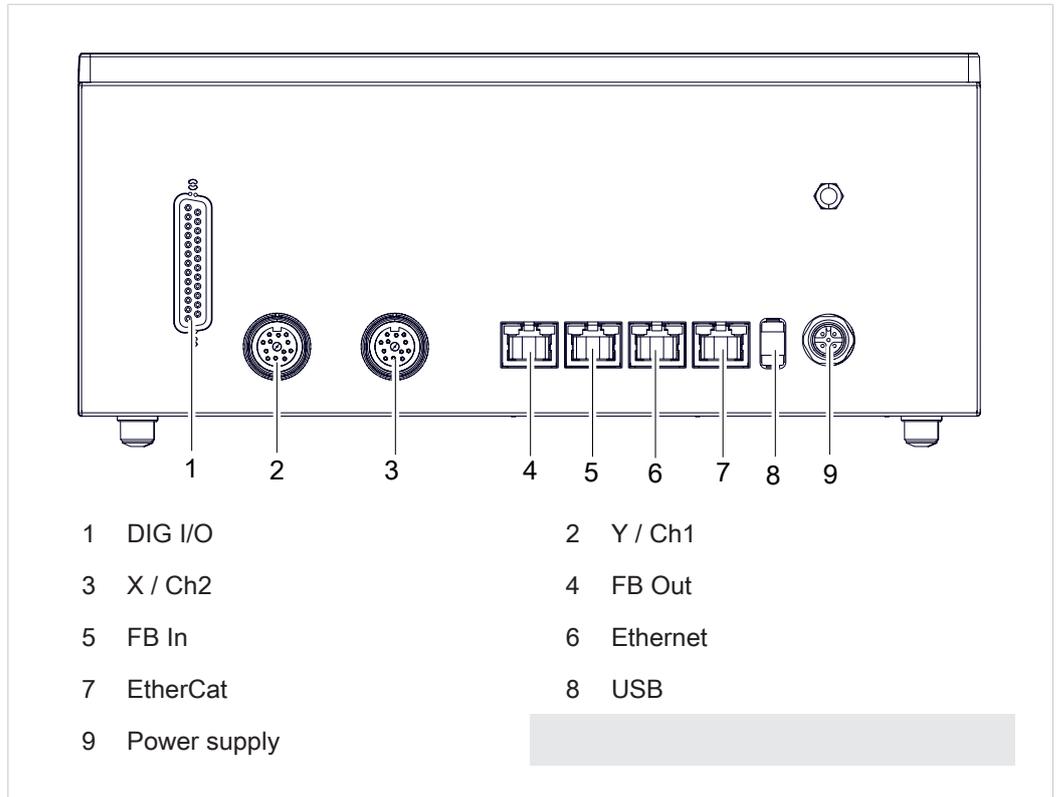


Fig. 9 Wall version: Connections

### 4.4.2 Pin allocation of wall version

PIN	Voltage	Type	Description
1	24 V DC	I	24 V supply voltage
2	-	-	not occupied
3	0 V DC	I	24 V supply voltage
4	-	-	not occupied
5	PE	I	PE

### 4.4.3 Digital inputs of wall version

Pin, D-SUB 25	OK	Color code	Description
14	I0	White	Program bit 0
15	I1	Brown	Program bit 1
16	I3	GREEN	Program bit 2
17	I4	YELLOW	Program bit 3

Pin, D-SUB 25	OK	Color code	Description
9	I5	White-blue	Program bit 4
10	I6	Brown-blue	Program bit 5
18	I7	Grey	Program strobe
19	I8	White-yellow	Offset external
20	I9	White-grey	Measurement start
	I10		Piece part is finished
21	I11	White-pink	External operating mode
22	I12	Brown-red	Error reset
	I13		Reserve
13	I14	White-red	Access level bit 0
25	I15	White-black <sup>2</sup>	Access level bit 1
12	0 V	Brown-green	0 V external (PLC)
11	0 V internal	Blue	0 V internal
23	24 V internal	Pink	+24 V from inside (source)

Tab. 8 25-pin Sub-D connecting cable

<sup>2)</sup> not wired in the input/output cable

#### 4.4.4 Digital outputs of wall version

Pin, D-SUB 25	OK	Color code	Description
1	Q1	Red	OK
2	Q2	Black	NOK
3	Q3	Yellow-brown	NOK alarm
4	Q4	Violet	Switching point S1
5	Q5	Grey-brown	Switching point S2
6	Q6	Grey-pink	Ready for measurement
7	Q7	Red-blue	Program ACK
8	Q8	Pink-brown	Switching Point 3
12	0 V	Brown-green	0 V external (PLC)
24	24 V	White-green	+24 V external (PLC)

Tab. 9 25-pin Sub-D connecting cable

#### 4.4.5 Wall-mounted housing: Connector assignment of DMS force transducers (channel Y)

##### 12-pole round socket

The force measurement of the Y-channel is carried out by choice via a DMS force transducer or a measuring sensor with a standardized process signal 0 - 10 V.

Pin	Signal name	Type Input/ Output	Notes
C	V +	O	Supply DMS V+
B	V -	O	Supply DMS V+
F	S- DMS	I	Measuring signal DMS -
G	S+ DMS	I	Measuring signal DMS +
E	F- DMS	O	Sensor cable DMS -
D	F+ DMS	O	Sensor cable DMS +
S			Shield
K	24 V DC	O	Auxiliary energy for measuring sensor 24 V
A	0 V DC	O	Mass external
L	Signal +	I	Measuring signal input standardized
M	Signal -	O	Mass measuring signal
H	Tare	O	Signal tare

For connection of the DMS with 4-cable technology, pin C and D as well as pin B and pin E are bridged.

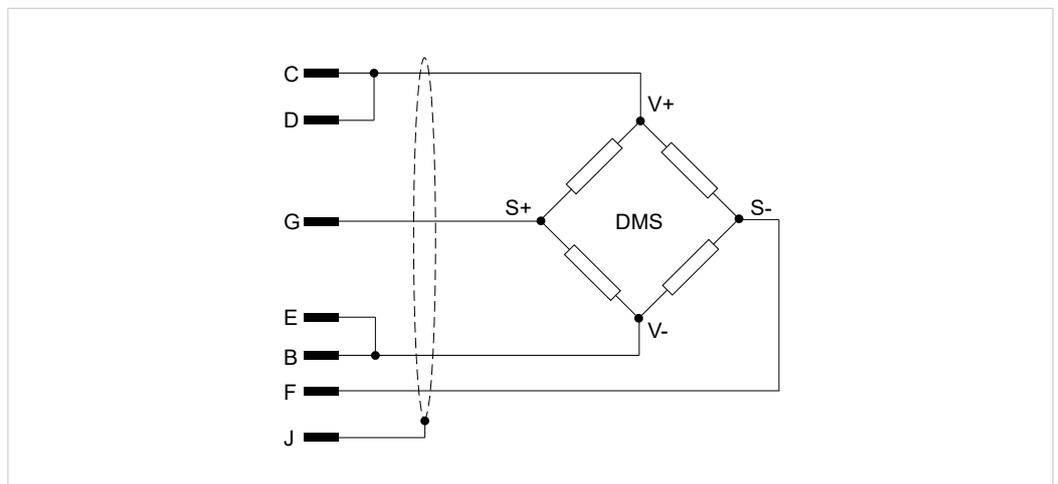


Fig. 10 DMS connector assignment without sensor cable

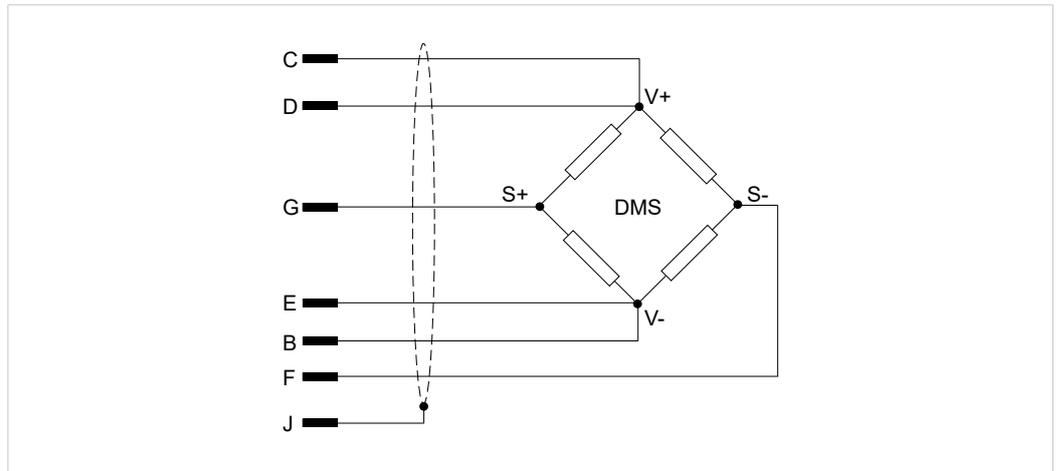


Fig. 11 DMS connector assignment with sensor cable

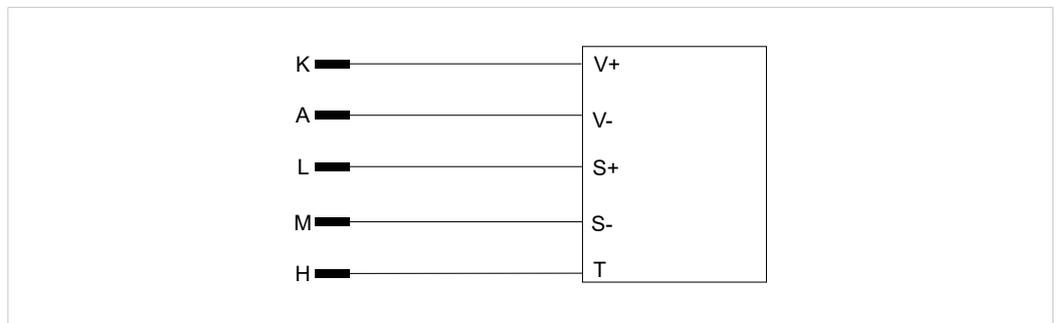


Fig. 12 Connection example of standard signal 0 - 10 V (ZKN with tare 24 V supply voltage)

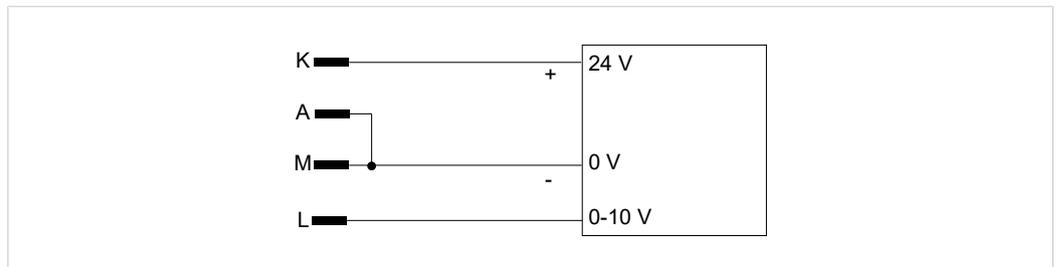


Fig. 13 Connection example ZDO 24 V supply voltage

#### 4.4.6 Wall-mounted housing: Connector assignment distance signal (channel X)

Pin	Signal name	Type Input/ Output	Notes
C	10 V +	O	Auxiliary energy for measuring sensor 10 V
K	24 V DC	O	Auxiliary energy for measuring sensor 24 V
M	0 V DC	O	Mass external
G	Signal +	I	Measuring signal input standardized
A	Signal -	I	Mass measuring signal
J			PE

Pin	Signal name	Type Input/ Output	Notes
H	Analog	O	Analog output 0 - 10 V process-dependent
E	0 V DC	O	Mass analog output
F	Signal -	I	Mass measuring signal

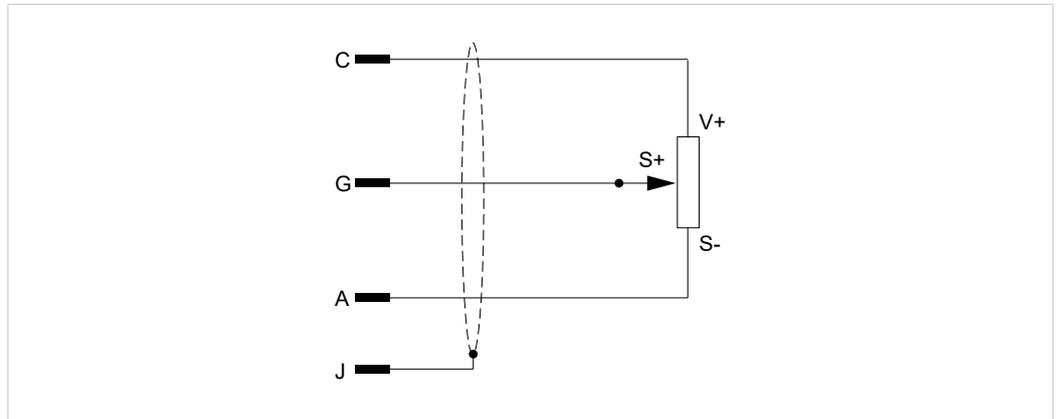
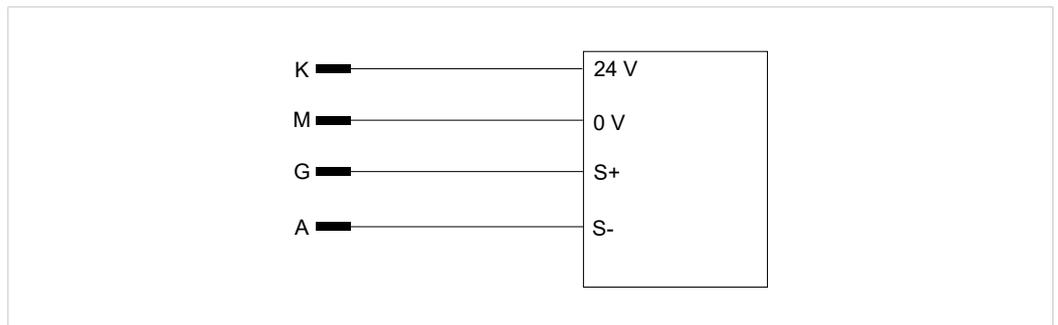


Fig. 14 Connection example of distance potentiometer (ZWW 10 V supply voltage)



## 4.5 Interfaces

### 4.5.1 Field bus interface

Inputs Byte	Designation
0.0	Program bit 0
0.1	Program bit 1
0.2	Program bit 2
0.3	Program bit 3
0.4	Program bit 4
0.5	Program bit 5
0.6	Program strobe
0.7	Offset external
1.0	Measurement start
1.1	Piece part is finished

<b>Inputs Byte</b>	<b>Designation</b>
1.2	External operating mode
1.3	Error reset
1.4	Reserve
1.5	Access level bit 0
1.6	Access level bit 1
1.7	Reserve
...	

<b>Outputs Byte</b>	<b>Designation</b>
0.0	OK
0.1	NOK
0.2	NOK alarm
0.3	Switching point S1
0.4	Switching point S2
0.5	Ready for measurement
0.6	Program ACK
0.7	Switching point S3
1.0	Reserve
...	

The final values are written on bytes 3 to 55 on the field bus (if this function is activated).

<b>Byte</b>	<b>Designation</b>
3	Status (Status 2 = OK / Status 3 = NOK)
4 to 7	Running number
8	Program
9	Status warning <sup>1</sup>
10, 11	Max. force [kN] x 100
12, 13	Max. distance [mm] x 100
14	Second
15	Minute
16	Hour
17	Day
18	Month
19	Year
20, 21	Reserve
22, 23	Window 1 force upper limit [kN] x 100
24, 25	Window 1 force lower limit [kN] x 100
26, 27	Reserve
28, 29	Window 1 distance upper limit [mm] x 100
30, 31	Window 1 distance lower limit [mm] x 100
32, 33	Reserve
34, 35	Window 2 force upper limit [kN] x 100
36, 37	Window 2 force lower limit [kN] x 100
38, 39	Reserve
40, 41	Window 2 distance upper limit [mm] x 100

Byte	Designation
42, 43	Window 2 distance lower limit [mm] x 100
44, 45	Reserve
46, 47	Window 3 force upper limit [kN] x 100
48, 49	Window 3 force lower limit [kN] x 100
50, 51	Reserve
52, 53	Window 3 distance upper limit [mm] x 100
54, 55	Window 3 distance lower limit [mm] x 100
56, 57	Actual value force [kN] x 100
58, 59	Actual value distance [mm] x 100
60, 61	Reserve
62, 63	Reserve

**<sup>1</sup> Legend byte 9**

Value	Meaning
0	No warning
30	Warning limit: OK counter order
31	Warning limit: Total counter order
32	Warning limit: OK counter shift
33	Warning limit: Total counter shift
34	Warning limit: Tool counter

## **5 Transport and storage**

### **5.1 Temporary storages**

- Use original packaging.
- Make sure that all electrical connections are covered to prevent dust ingress.
- Protect the display against sharp-edged objects e.g. due to cardboard or hard foam.
- Wrap the device, e.g. with a plastic bag.
- Store the device only in closed, dry, dust-free and dirt-free rooms at room temperature.
- Add drying agent to the packaging.

## 5.2 Dispatch for repair

To dispatch the product for repair to TOX® PRESSOTECHNIK, please proceed as follows:

- Fill in the "Accompanying repair form". This we supply in the service sector on our website or upon request via e-mail.
- Send us the completed form via e-mail.
- Then you will receive the shipping documents from us via e-mail.
- Send us the product with the shipping documents and a copy of the "Accompanying repair form".

For contact data see [Contact and source of supply, Page 10](#) or [www.tox.com](http://www.tox.com).

## 6 Commissioning

### 6.1 Preparing System

1. Check installation and mounting.
2. Connect required lines and devices, e.g. sensors and actuators.
3. Connect supply voltage.
4. Make sure that the correct supply voltage is connected.

### 6.2 Starting system

- ✓ System is prepared.  
See [Preparing System, Page 37](#).
- Switch on the plant.
- ▶ The device starts the operating system and the application.
- ▶ The device switches to the start screen.

## 7 Operation

### 7.1 Monitoring operation

No operating steps are necessary during ongoing operation.



The operating procedure must be monitored constantly in order to detect faults in time.

## 8 Software

### 8.1 Basic layout of the interface

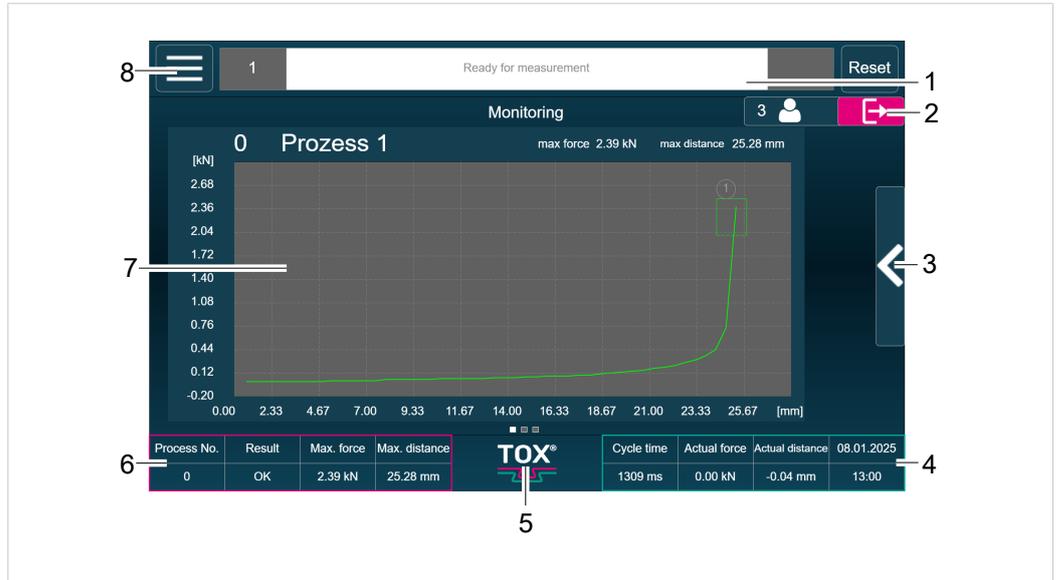


Fig. 15 Basic layout of the interface

	Designation	Function
1	Status and information bar	Displayed are: <ul style="list-style-type: none"> <li>• Error Number</li> <li>• Error Text</li> </ul> The error message list is opened with a tap. <ul style="list-style-type: none"> <li>• Necessary user level for acknowledging the error message</li> <li>• Reset button to acknowledge the message</li> </ul>
2	Logged in user	The logged in user is displayed. Logging the user in and out by tapping on the button.
3	Submenu	Opens the specific submenu with process parameters.
4	Process information	Displays the current values of the plant.
5	TOX® Logo	Tapping on the logo opens the information page of the used software version.
6	Quick overview	Displays the actual value of the last traveled process.
7	Main screen area	Displays the evaluation/diagram recording of the last traveled process.
8	Menu tree	Displays the menu tree.

## 8.2 Information and status bar

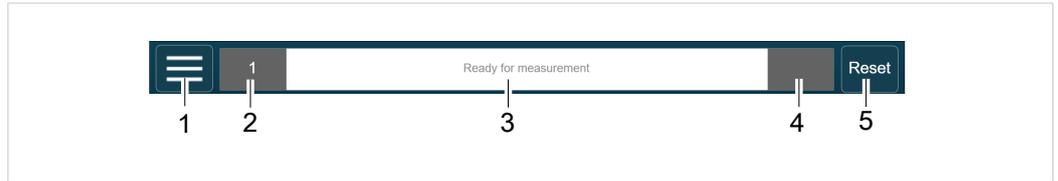


Fig. 16 Information and status bar

	Designation	Function
1	Main menu	Opens the main menu.
2	Status, warning and error numbers	The corresponding numbers are displayed.
3	Status, warning and error message	The corresponding messages are displayed in plain text.
4	User level for acknowledging	During an error also the necessary user level for acknowledging is displayed.
5	Reset	The message is reset.

If several messages appear simultaneously in the text field for error messages and status displays, they are cycled through every five seconds. Tapping an error message opens the error message list containing all current error messages and warnings.

## 8.3 Selection in the main menu bar

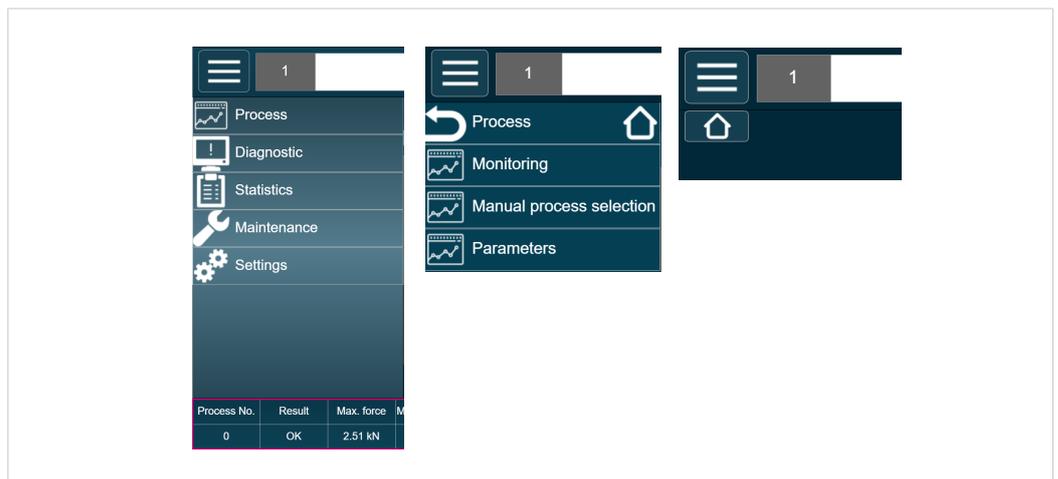


Fig. 17 Menu selection bar

	Button	Function
	Home	Tapping on the <Home> button in the main menu bar takes you back to the main menu. Tapping on the <Home> button on the selected menu image takes you back to the start page.
	Process	Opens the monitoring menu. Manual process selection and parameters.

	Button	Function
	Diagnostic	Displays the following information: Error log, change log, events log, BUS interface and inputs/outputs
	Statistics	Displays the following information: Final values, curve data, shift counter and total counter
	Maintenance	Displays the following information: Service life counter, customer counter and information log
	Settings	Displays the following information: Configuration of force sensor, distance sensor, I/O, evaluation options and devices

## 8.4 Process menu

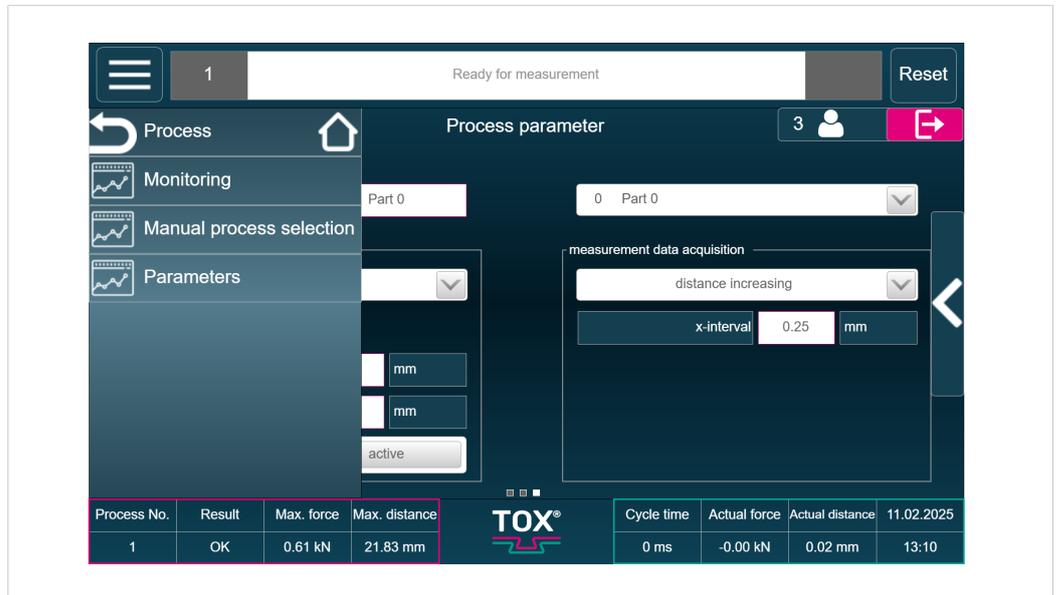


Fig. 18 Process menu

	Button	Function
	Monitoring	Process monitoring is used to monitor the entire working process of a system.
	Manual process selection	Selection of a process.
	Parameters	Opens the menu for parameterizing the respective processes.

All settings in the process menu can be set separately for every process.

### 8.4.1 Monitoring menu

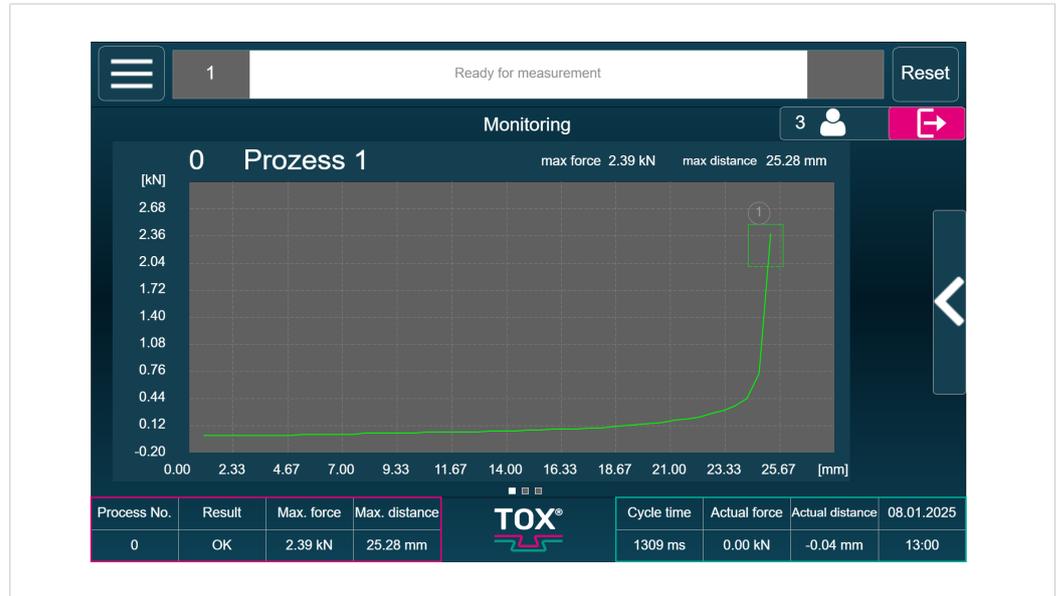


Fig. 19 Monitoring menu

Process monitoring is used to control the entire working process of a system. The force/travel characteristic is monitored during the working process. For this purpose, process monitoring reads the force/travel data pairs from two measuring channels 'X' and 'Y' during the measuring operation. The data are written to memory and can be displayed graphically.

The subsequent force/travel function is then compared with the specified data limits of the set window values. An OK message is issued if the data limits are adhered to. Otherwise, an NOK message is issued.

If no windows are activated, no window boundaries are violated and an OK message is issued after each process.

**Submenu**

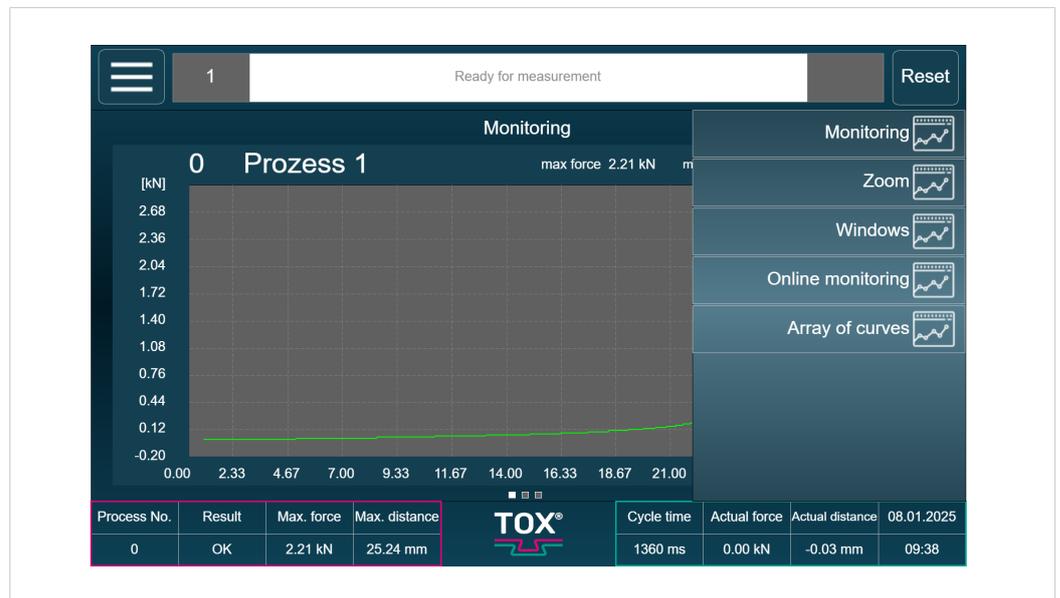


Fig. 20 Monitoring menu

Tap on the **Submenu** button to open further control options.

Button	Function
Monitoring	Displays the curve of the last process.
Zoom	Sets the zoom area of the diagram.
Windows	Displays the setting options for the monitoring windows.
Online monitoring	Displays the setting options for online monitoring.
Array of curves	Displays the setting options for the monitoring windows.

### Zoom menu

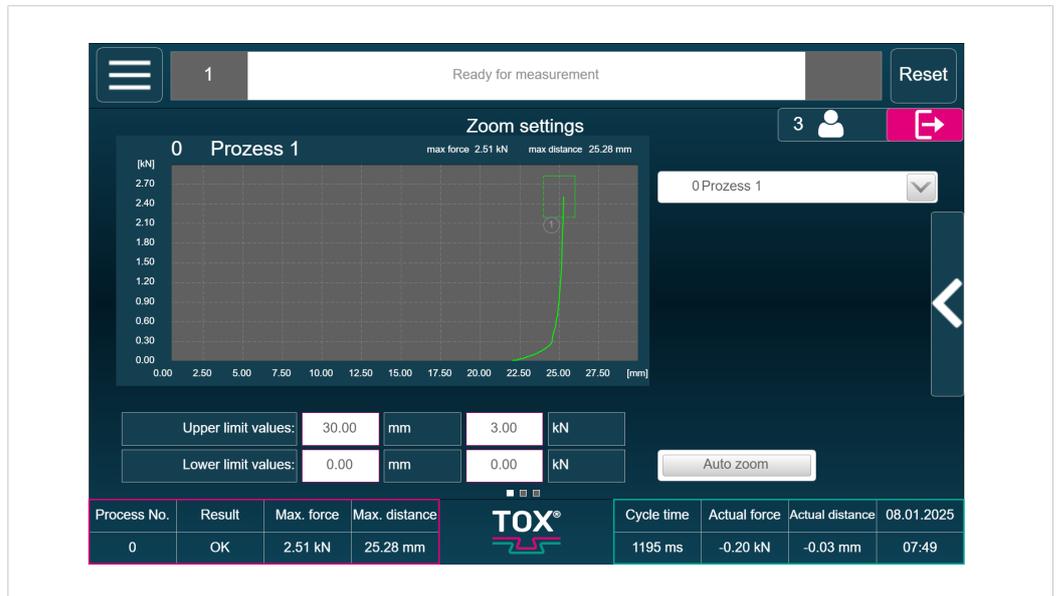


Fig. 21 Monitoring menu

In the Zoom menu the action window can be adjusted via the input fields (min./ max.) of the respective axes.

Button	Function
Upper / lower limit values	Entering the values for the axis limit values in [mm] and [kN].
Auto zoom	Automatic zooming of the diagram to make the curve fully visible.

## Menu window

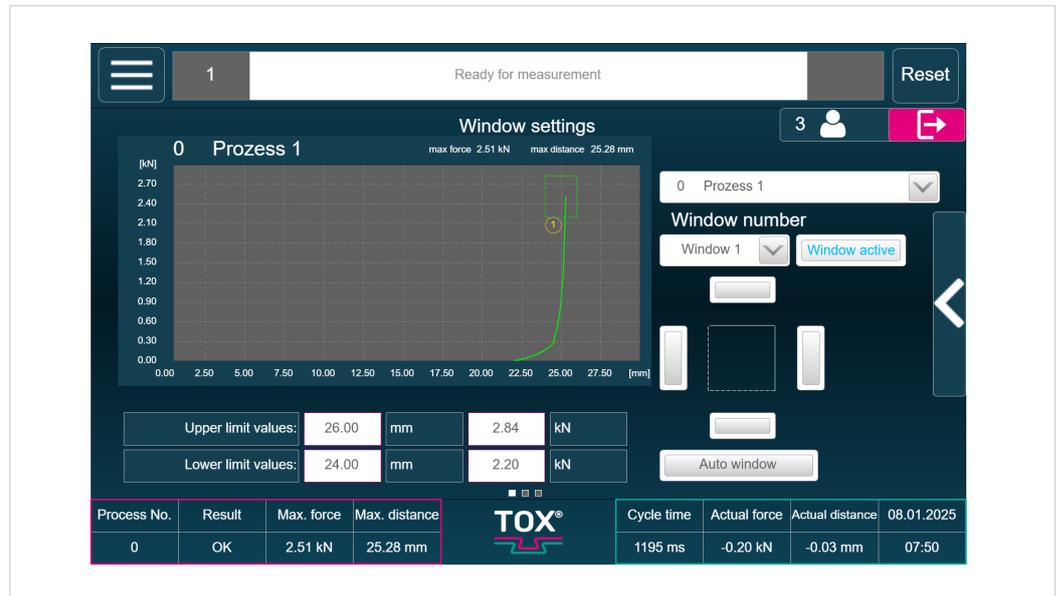


Fig. 22 Window menu

The evaluation windows are changed, created or deleted in this menu.

Button	Function
Process selection	Selects the desired process.
Windows selection	Selects the desired window.
Window active	Activates or deactivates the window.
Auto window	Sets the window to the final value of the curve.
Upper / lower limit values	Entering the values for the axis limit values in [mm] and [kN].

The settings only apply for the currently selected process. Every window is identified by a number on the frame of the window.

Only one window is selected at a time. The selected window can be recognized at the **Window number** or the yellow window number. A window is selected by tapping on the **Window number** in the drop-down menu.

The text fields Upper limit values and Bottom limit values show the dimensions of the selected window.

### Edit window type

The measuring curve must enter at the specified entry side of the window and exit at the specified exit side.

Entry side and exit side are freely definable. The first point of intersection of the curve with a window boundary is the entry event, the subsequent point of intersection with a window boundary is the exit event.

### Online monitoring menu

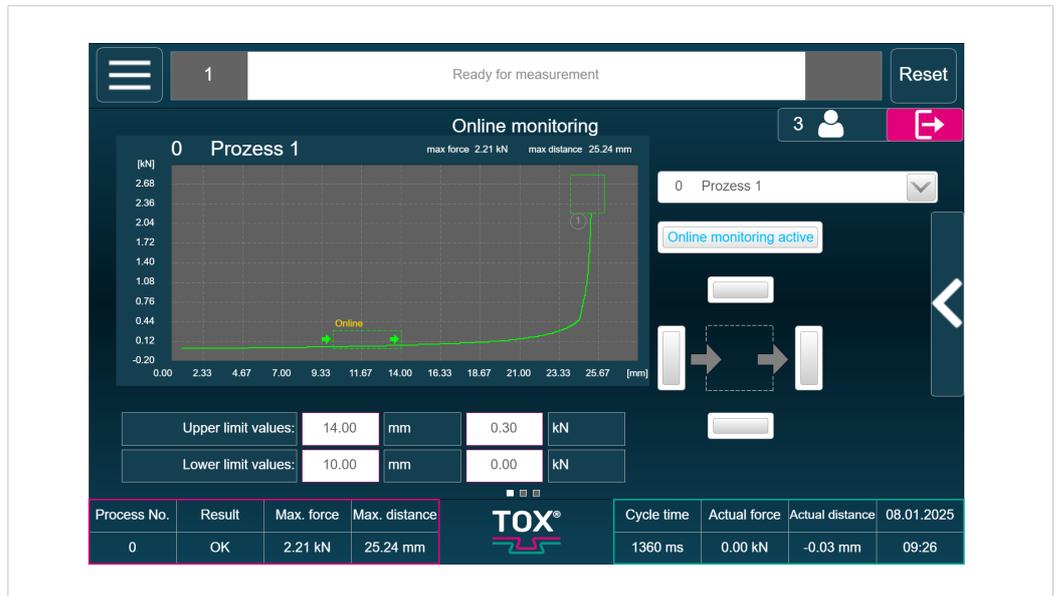


Fig. 23 Online monitoring menu

When online monitoring is active, the set limit values are monitored during measurement.

As soon as a violation is identified, a signal is forwarded to the PLC so that an action can be taken (e.g. if a press comes down at an angle or there is a premature step-up in force, it will be opened immediately).

	Button	Function
	Online monitoring active	Activates/deactivates online monitoring.
	Windows selection	Selects the desired window.
	Upper / lower limit values	Entering the values for the axis limit values in [mm] and [kN].

### Array of curves menu



Fig. 24 Array of curves menu

Up to 9 curves can be superimposed in the array of curves.

The curve selection and the corresponding curves can be selected via the sub-menu.

Tap on the **Submenu** button to open further control options.

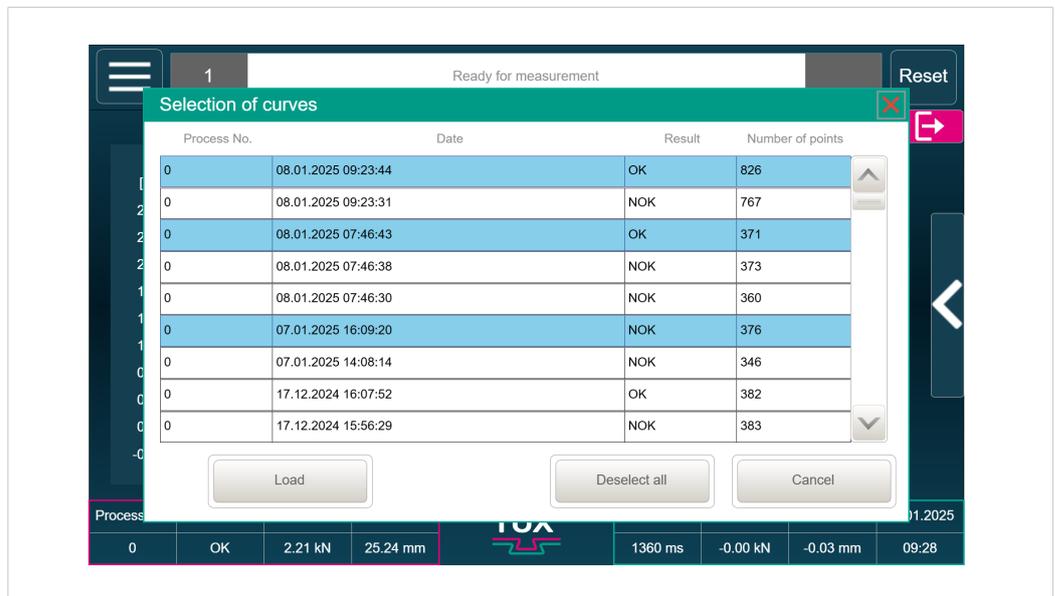


Fig. 25 Array of curves submenu

Button	Function
Load	Loads the selected curve(s).
Deselect all	Deselects all selected curves in the table.

### 8.4.2 Manual process selection menu

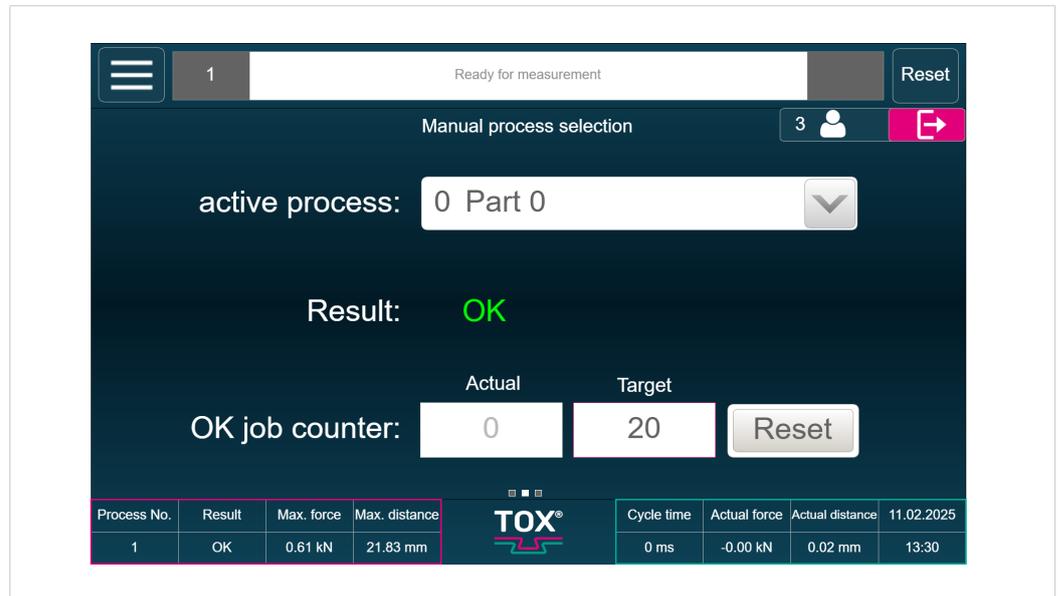


Fig. 26 Manual process selection menu

A process can be selected manually in this menu.

	Button	Function
	Active process	Selects the active process.
	Result	Shows the result of the run process.
	IO order counter	Displays the number of the IO cycles. With reset the counter is reset to zero. The order counter is deactivated with a setpoint value of "0".

 As long as the "Operating mode external" signal is active, a manual process selection is blocked.

In this menu an order counter can be activated (see [Settings menu, Page 000](#)). Then totaling is made at every OK process.

If the setpoint is reached, a message appears in the status display and further recording is possible only by actuating the reset button of the OK order counter. The order counter is deactivated with a setpoint value of "0".

### 8.4.3 Process parameters menu

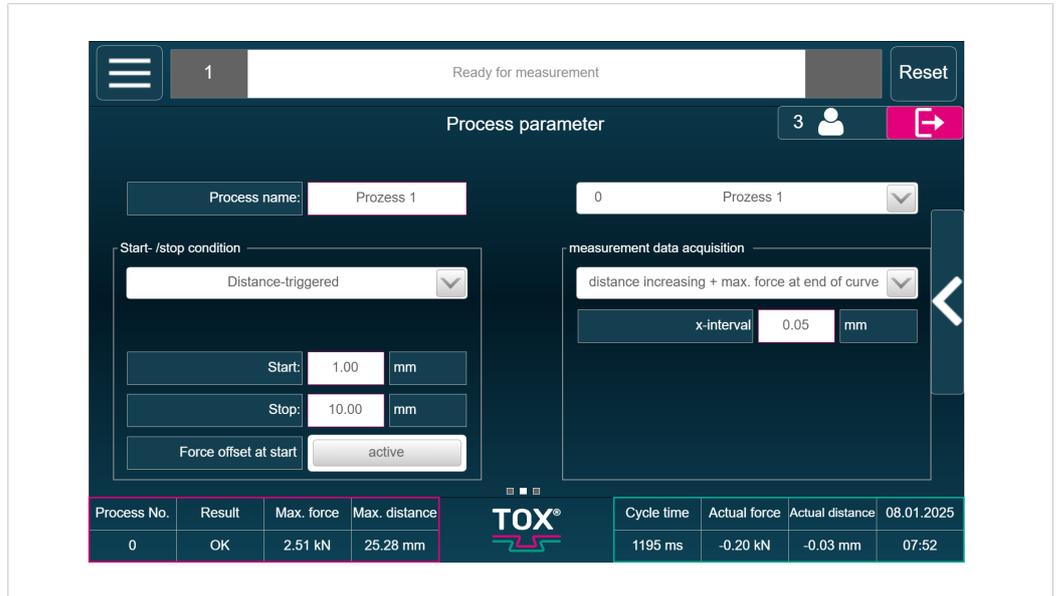


Fig. 27 Process parameters menu

Process parameters are entered in this menu.

	Button	Function
	Process name	Entry of a freely selectable name for the selected process.
	Start/stop condition	<p>Defines when and how the measurement should be started and stopped. The following options are available:</p> <ul style="list-style-type: none"> <li>• &lt;Distance-triggered&gt; A measurement is started as soon as the distance set under &lt;Start&gt; is exceeded. The measurement is stopped as soon as the distance set under &lt;Stop&gt; drops below the setpoint. With option &lt;Force offset at start&gt; it is enforced that at the moment of exceeding the start threshold, the actual force is used as offset for the measurement.</li> <li>• &lt;Force-triggered&gt; A measurement is started as soon as the force set with &lt;Start&gt; is exceeded, and stopped as soon as the force set with &lt;Stop&gt; is not reached. With option &lt;Distance offset at start&gt; it is enforced that at the moment of exceeding the start threshold, the actual distance is used as offset for the measurement.</li> <li>• &lt;Start/stop of PLC&gt; A measurement is started and terminated via the digital signal of an external control system. Using the option &lt;Trigger&gt; means that when a particular force or distance value is exceeded, the other measured value is adjusted to zero.</li> </ul>
	Measuring data recording	<p>In this menu the type of measurement data acquisition is configured. The following options are available:</p> <ul style="list-style-type: none"> <li>• &lt;Distance rising&gt;</li> <li>• &lt;Distance rising + max. force at end of curve&gt;</li> <li>• &lt;Distance increasing or decreasing&gt;</li> <li>• &lt;Force or distance changing&gt;</li> <li>• &lt;Time-triggered: sampling rate x ms&gt;</li> </ul>

**Meta data recording**

	Parameters	Function
	<Distance rising>	<ul style="list-style-type: none"> <li>The measured values are measured with maximum sampling rate (1 kHz) but only stored if the distance compared to the last measured value has changed by the X-step entered.</li> <li>This mode is recommended if negative changes of the distance are not intended to be stored (usually clinch applications or pressing applications where only positive distance changes are relevant).</li> <li>The number of pairs of values to be stored remains small. The measuring curve occupies little storage place and can be quickly drawn and evaluated.</li> </ul>
	<Distance rising + max. force at end of curve>	<ul style="list-style-type: none"> <li>If the final force can increase without changing the distance (block force), this mode is suited.</li> <li>Here the max. force and the max. distance measured with max. sampling rate are recorded (comparable to a maximum indicator).</li> <li>This pair of values is added to the curve.</li> </ul>
	<Distance increasing or decreasing>	<ul style="list-style-type: none"> <li>The difference to &lt;Distance rising&gt; mode is that here the pairs of values are stored when the distance in positive or negative direction has changed since the last stored value.</li> <li>This mode is recommended if also negative distance changes have to be recorded (e.g. pressing applications with snap-back effects).</li> <li>The number of pairs of values to be stored remains small. The measuring curve occupies little storage place and can be quickly drawn and evaluated.</li> </ul>
	<Force or distance changing>	<ul style="list-style-type: none"> <li>In this mode, a pair of values is stored if, since the last stored pairs of values, either the distance has changed by the X-step in the positive or negative direction, or the force has changed by the Y-step in the positive or negative direction.</li> <li>This mode is recommended if the force can change without a change in distance taking place (e.g. applications with large slip-in effects).</li> </ul>
	<Time-triggered: sampling rate x ms>	<ul style="list-style-type: none"> <li>In this mode, every x ms a pair of values is stored time-controlled (depending on the selection of the sampling rate).</li> <li>If no changes are detected, similar pairs of values offering no information but occupying storage place and decelerating the evaluation and the drawing of the curve are stored with this mode.</li> <li>If the memory is full with the maximum number of possible curve points, an error message is generated and the complete clinching/pressing process is not recorded. In contrast, the other measurement modes are independent of the execution time of the clinching/pressing process.</li> <li>Therefore, this mode is recommended for special applications only where other modes do not lead to satisfying results.</li> </ul>

Processes can be copied and switching points can be defined via the submenu.

Tap on the **Submenu** button to open further control options.

## Switching points

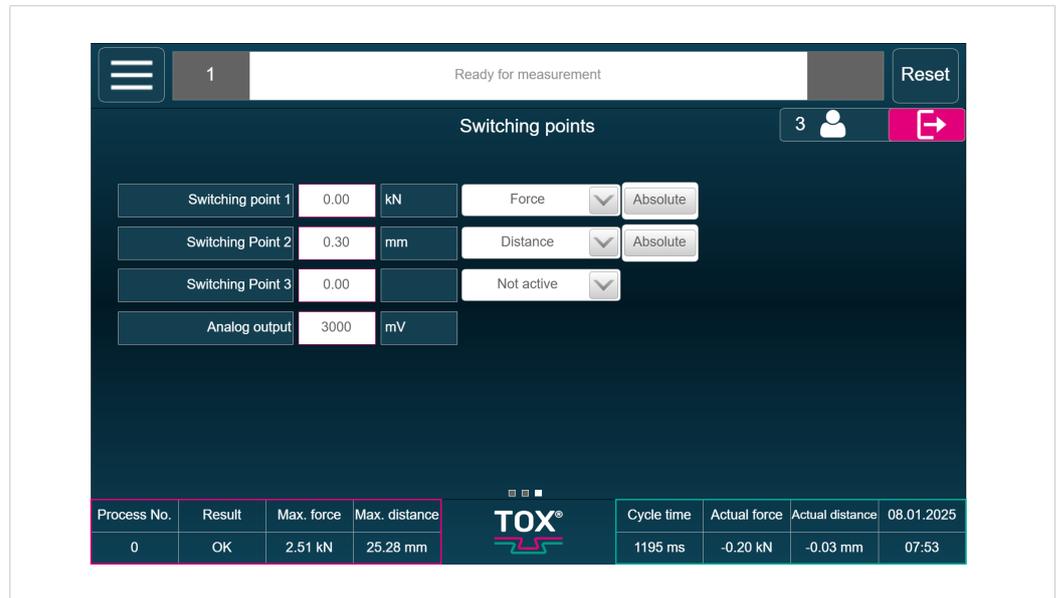


Fig. 28 Switching points submenu

In this menu the switching points 1 - 3, as well as a fixed value of the analog output for the selected process can be set.

### Switching point 1-3:

For the switching points the force or distance signal can be selected as source. If the set value of a switching point is reached or exceeded, a signal for this switching point is pending at the interface.

### Function absolute

If function <Absolute> is activated for the respective switching point, the set value refers to the absolute zero point. **NOTE!**

This selection is only possible when the option <Force or distance offset at start> is activated in menu <Process parameters> for the <Start / stop condition>. See [Process parameters menu, Page 49](#).

## Copy processes

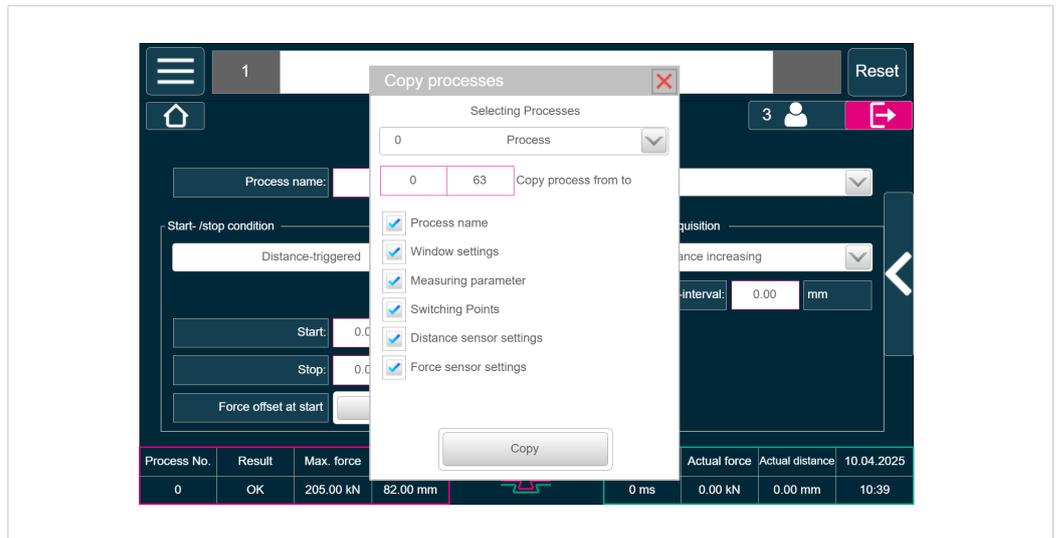


Fig. 29 Copy submenu

Button	Function
Selecting process	<p>The process to be copied is selected and configured. A window opens and offers the following options:</p> <ul style="list-style-type: none"> <li>• &lt;Selecting Processes&gt;</li> <li>• &lt;Copy process from to&gt; Entry from 0 to 63.</li> </ul> <p>Additional categories can be selected.</p> <ul style="list-style-type: none"> <li>• &lt;Process name&gt;</li> <li>• &lt;Window settings&gt;</li> <li>• &lt;Measuring parameters&gt;</li> <li>• &lt;Switching points&gt;</li> <li>• &lt;Distance sensor settings&gt;</li> <li>• &lt;Force sensor settings&gt;</li> </ul> <p>Tapping on the Copy button starts the copying process.</p>

## 8.5 Diagnosis menu

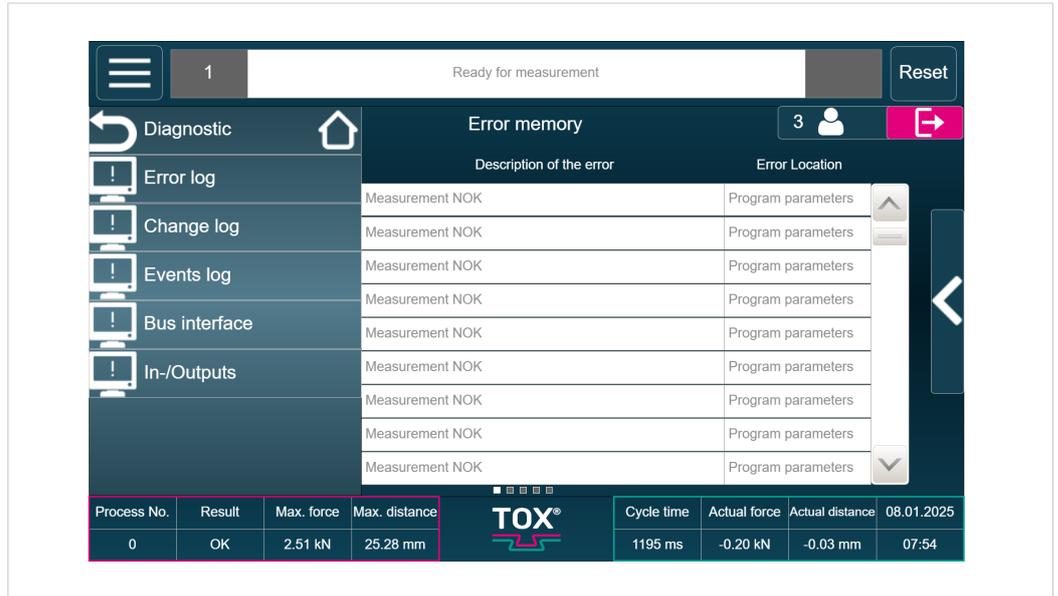


Fig. 30 Diagnosis menu

	Button	Function
	Error log	Opens the error memory.
	Change log	Opens a list with recorded changes.
	Events log	Opens a list with recorded events.
	Bus interface	Opens a list with interface definition and information.
	In-/Outputs	Opens a list with information about the inputs/outputs.

### 8.5.1 Error memory menu

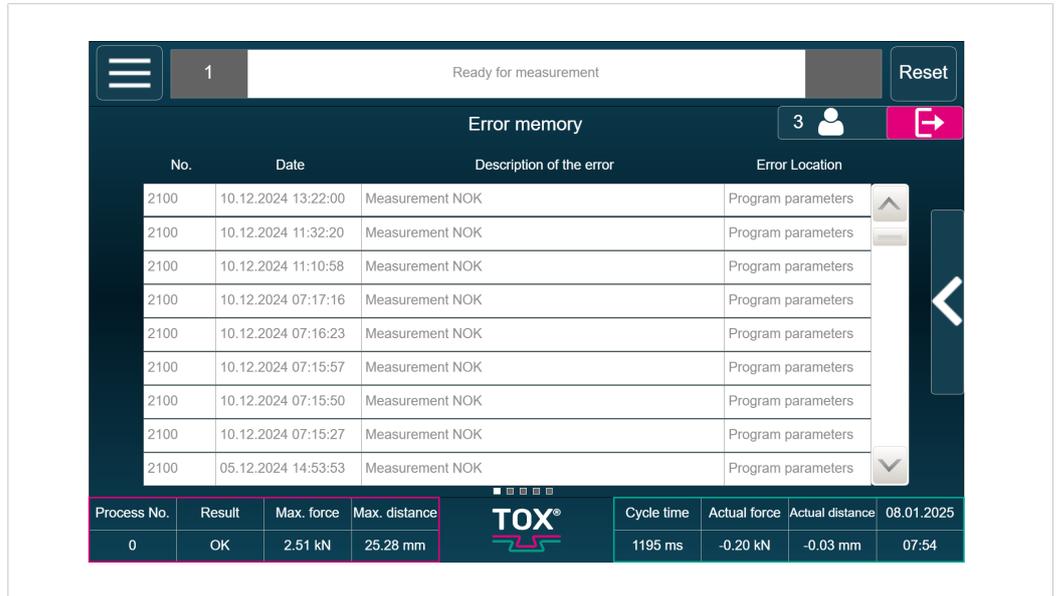


Fig. 31 Error memory menu

In this menu you can view the last 1,000 errors with time stamp that occurred. The error number can be seen in the first column. Next to the error description, also the location of the error is listed. The error memory can be exported as CSV file via the submenu. Tap on the **Submenu** button to open further control options.

### 8.5.2 Change memory menu

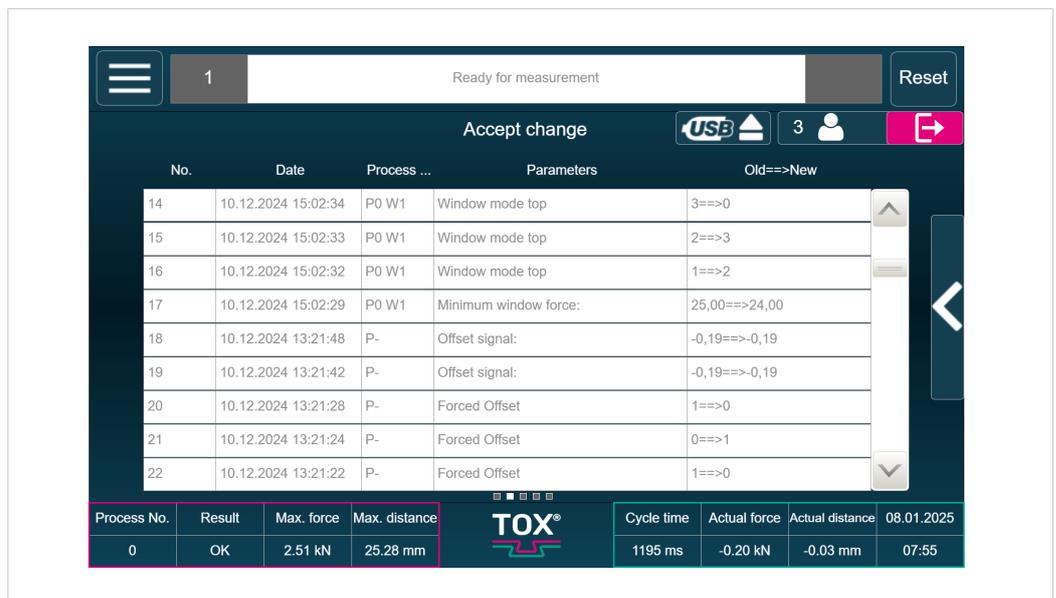


Fig. 32 Change memory menu

In this menu you can view the last 1,000 changes (<Old ==> New>) with time stamp that occurred.

The change memory can be exported as CSV file via the submenu.

Tap on the **Submenu** button to open further control options.

### 8.5.3 Recording of events menu

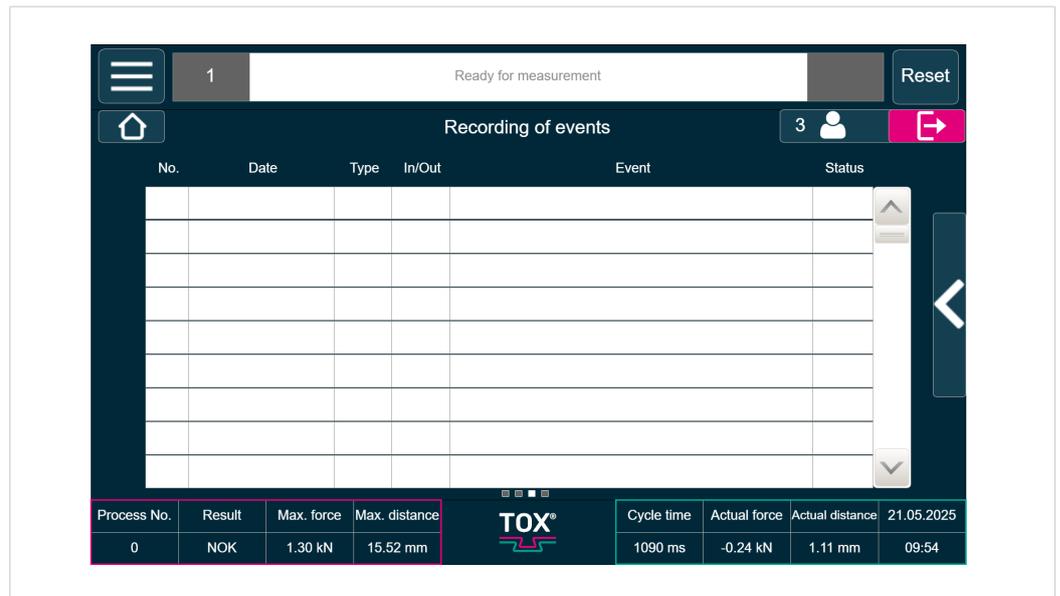


Fig. 33 Events memory menu

In this menu you can view the last 1,000 events that occurred.

The events can be exported as CSV file, and recordings can be started/stopped and deleted via the submenu.

Tap on the **Submenu** button to open further control options.

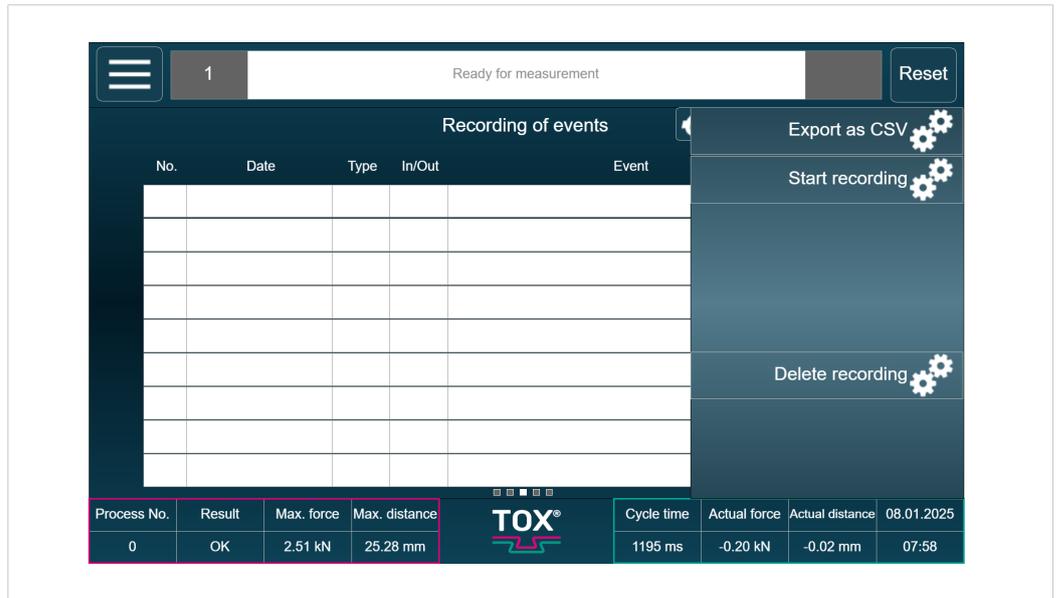


Fig. 34 Events memory submenu

### 8.5.4 BUS interface menu

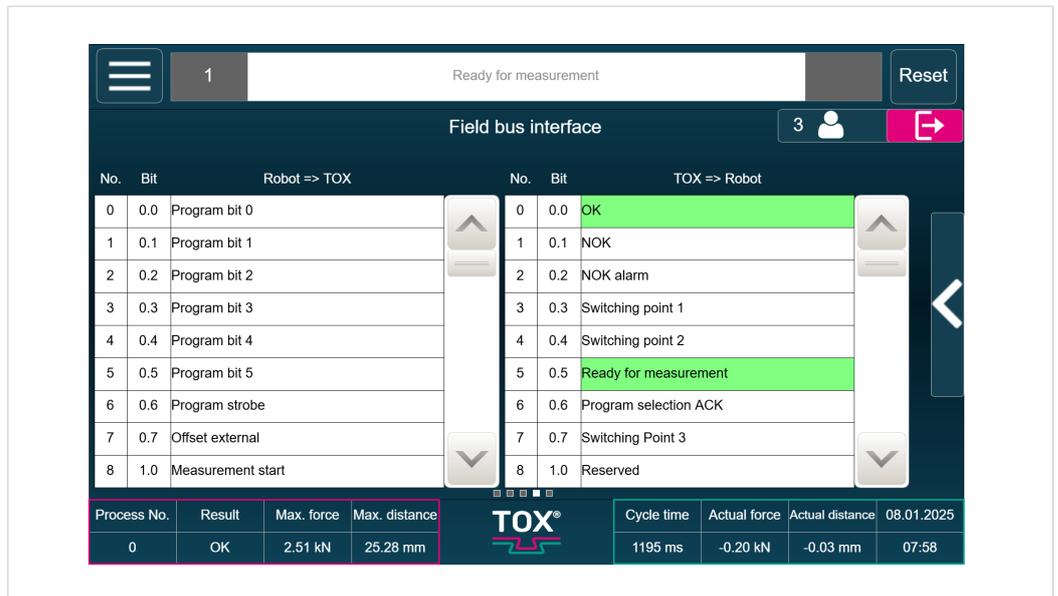


Fig. 35 BUS interface menu

Information for the fieldbus interface can be entered via the submenu. Tap on the **Submenu** button to open further control options.

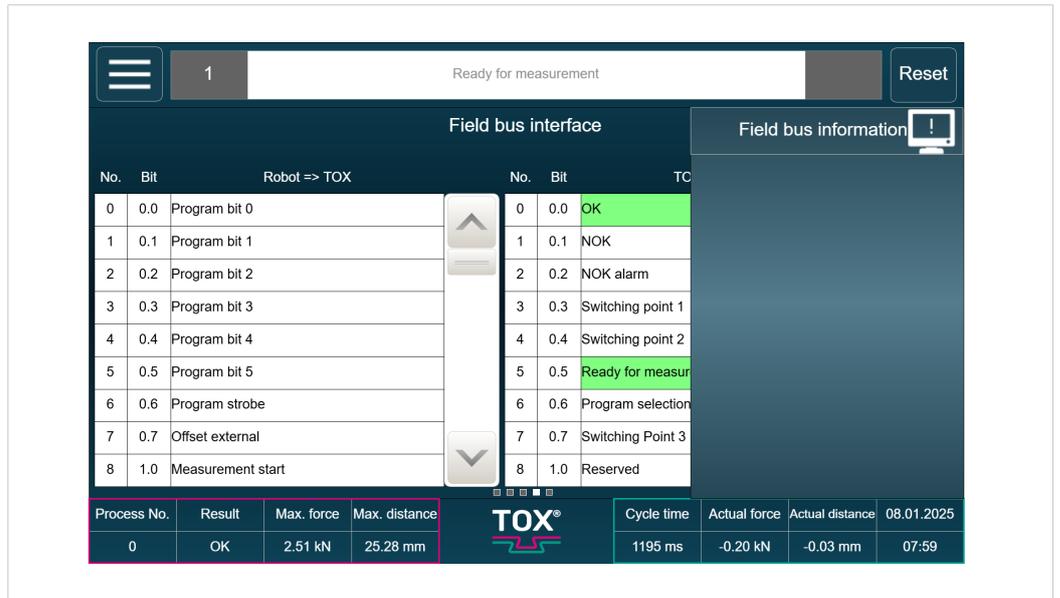


Fig. 36 BUS interface submenu

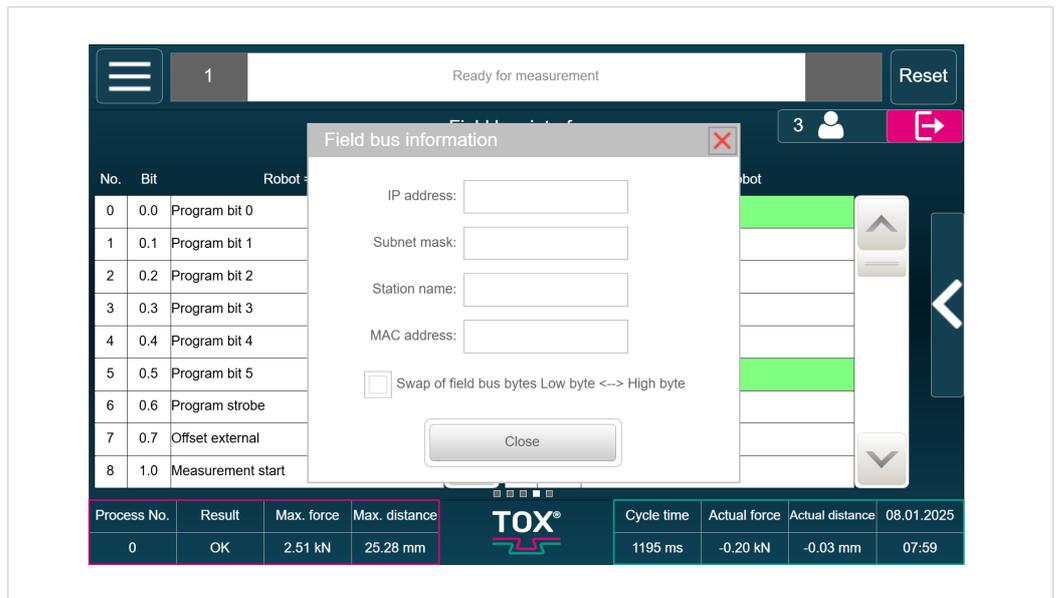


Fig. 37 Fieldbus information submenu

### 8.5.5 Input/output interface menu

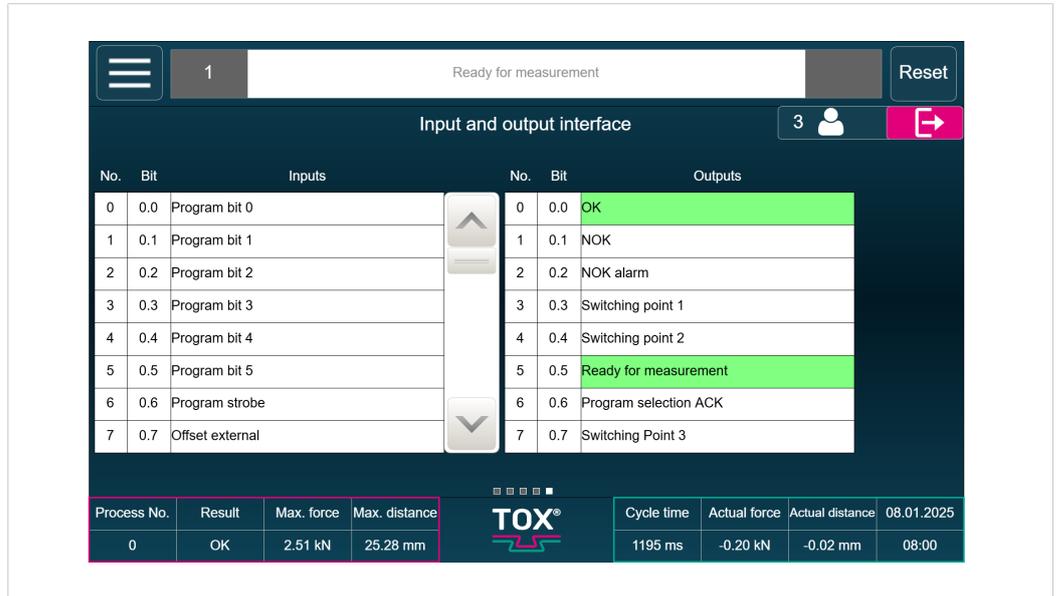


Fig. 38 Input/output interface menu

The menu displays information for the input/output interface.

### 8.6 Statistics menu

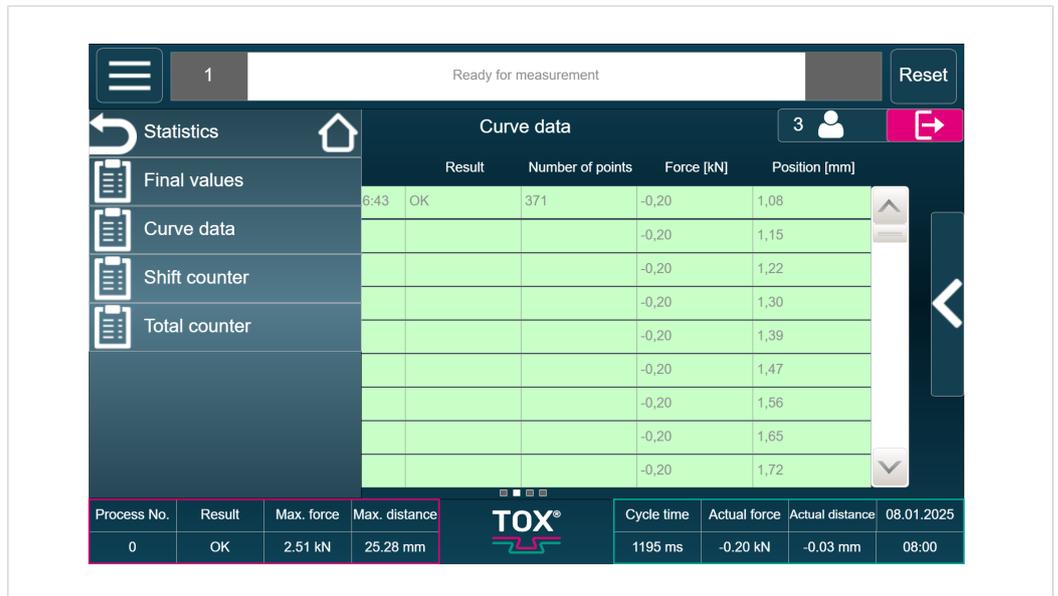


Fig. 39 Statistics menu

Button	Function
Final values	Opens a list with recorded final values.
Curve data	Opens a list with the recorded curve data.

	Button	Function
	Shift counter	Opens the setting options of the shift counter.
	Total counter	Opens the setting options of the total counter.

### 8.6.1 Final values menu

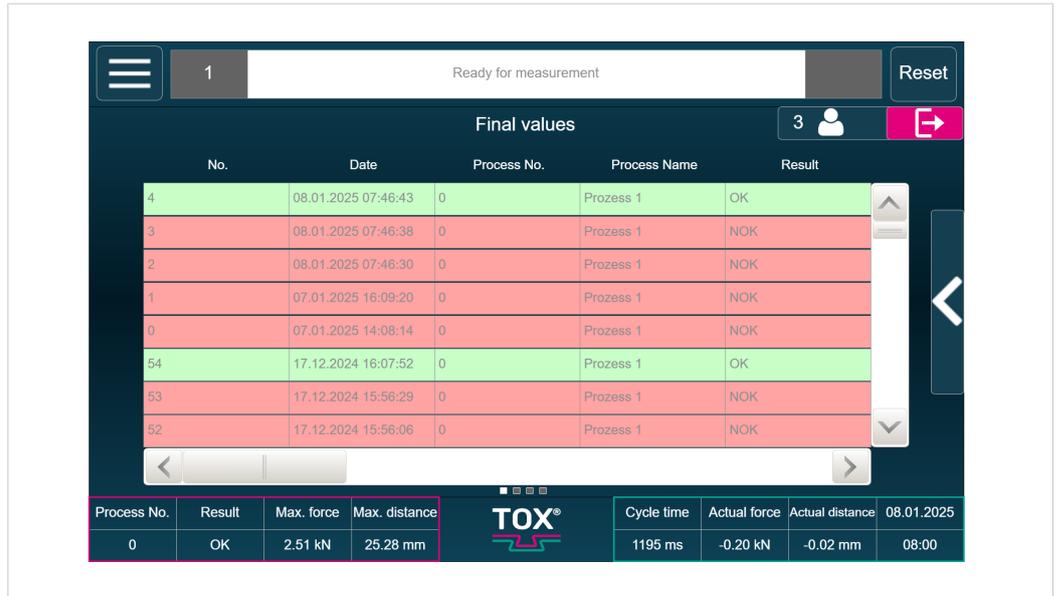


Fig. 40 Final values menu

The final values can be exported as CSV file via the submenu.  
Tap on the **Submenu** button to open further control options.

### 8.6.2 Curve data menu



Fig. 41 Curve data menu

The curve data can be exported as CSV file via the submenu. The individual curves can be selected.

Tap on the **Submenu** button to open further control options.



Fig. 42 Curve data submenu

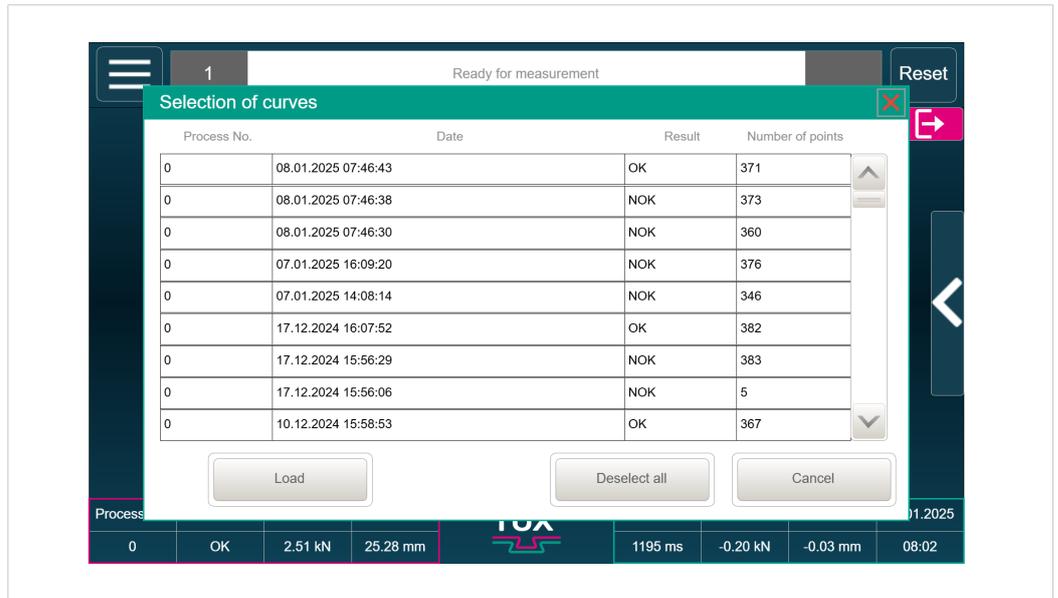


Fig. 43 Curve data selection submenu

Button	Function
Load	Loads the selected curve(s).
Deselect all	Deselects all selected curves in the table.

### 8.6.3 Shift counter menu

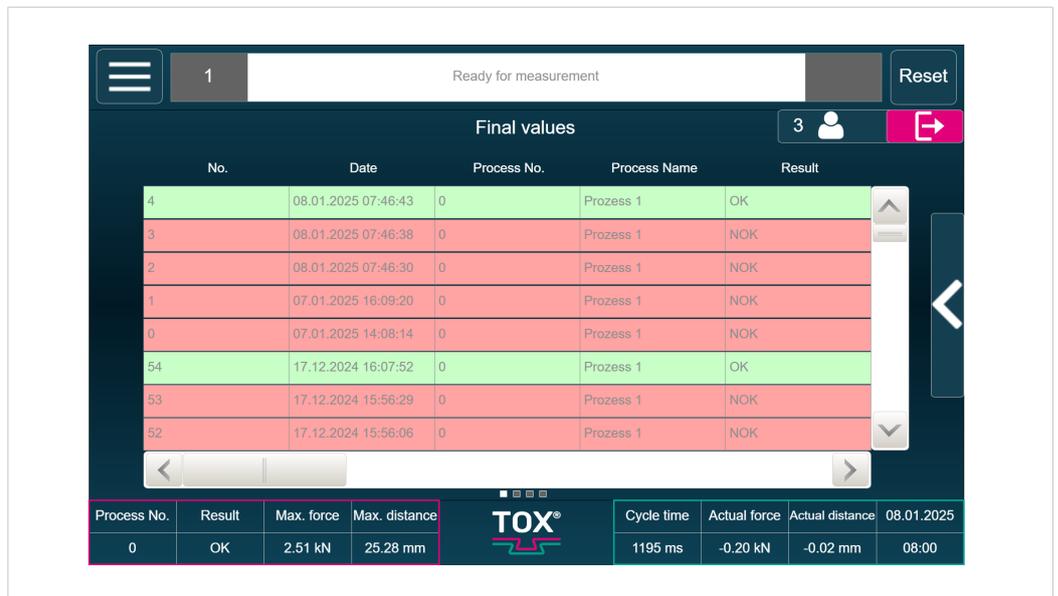


Fig. 44 Shift counter menu

In this menu the counters are configured.

	Button	Function
	Reset	Resets the counter values.
	Current	Displays the current value.
	Early warning	When the entered value is reached, a message is output.
	Early warning	When the entered value is reached, an error message is output. The process is then stopped as a result.

### 8.6.4 Total counter menu

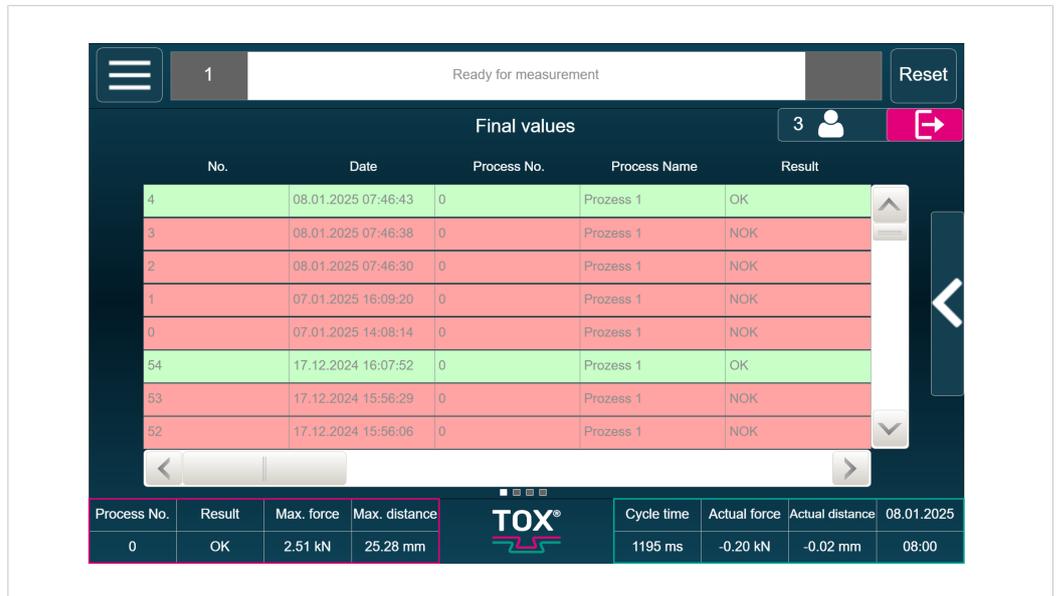


Fig. 45 Total counter menu

In this menu the counters are configured.

	Button	Function
	Early warning	When the entered value is reached, a message is output.
	Current	Displays the current value.
	Early warning	When the entered value is reached, a message is output.
	Early warning	When the entered value is reached, an error message is output. The process is then stopped as a result.

## 8.7 Maintenance menu

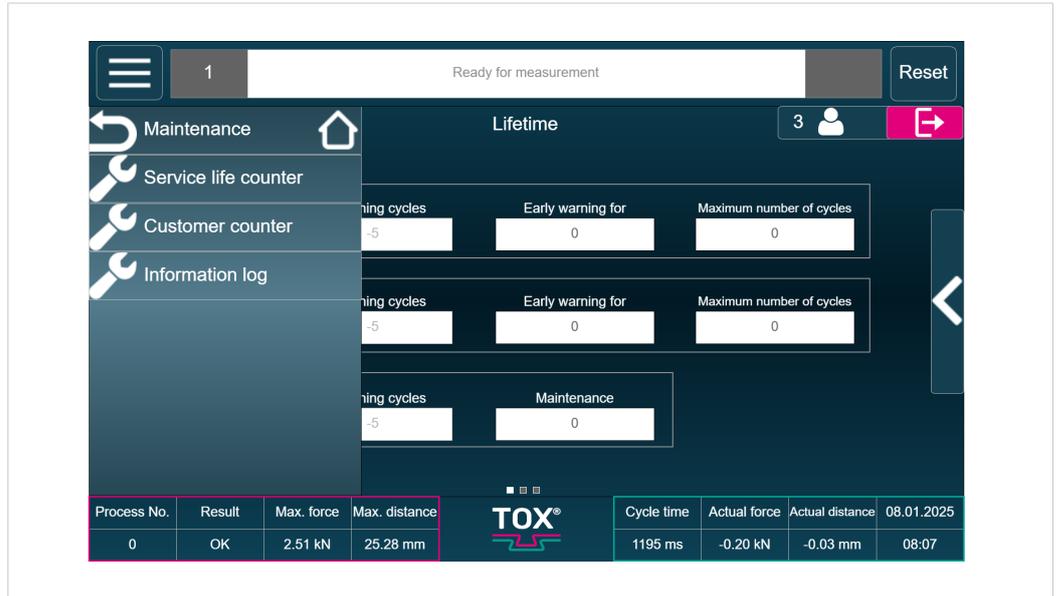


Fig. 46 Maintenance menu

Button	Function
Service life counter	Opens the setting options of the service life counter.
Customer counter	Opens the setting options of the customer-specific counter.
Information log	Opens the list of the information memory.

### 8.7.1 Service life counter menu

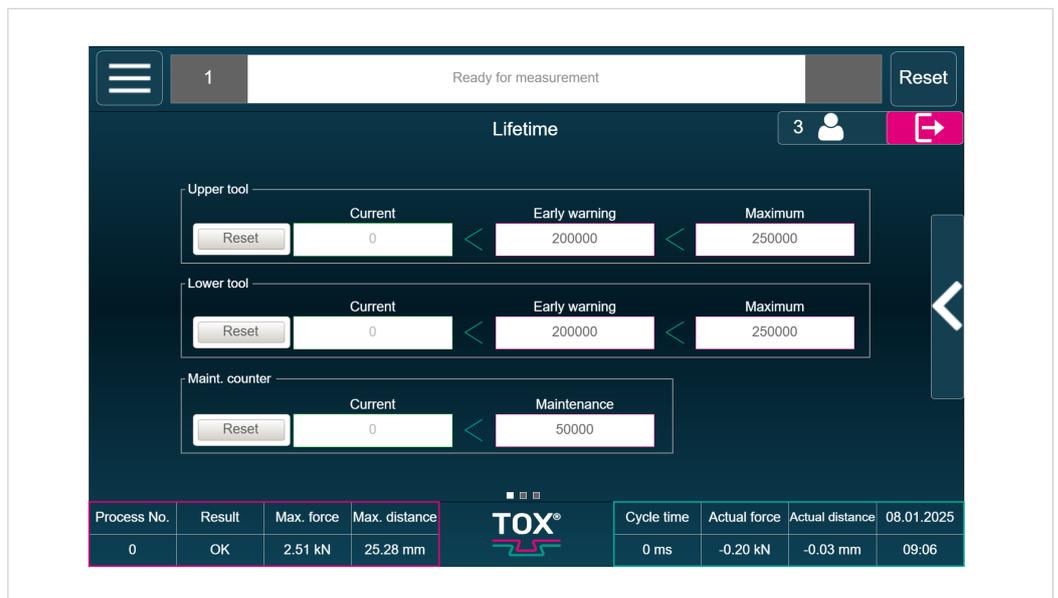


Fig. 47 Service life counter menu

In this menu the counters are configured.

	Button	Function
	Early warning	When the entered value is reached, a message is output.
	Current	Displays the current value.
	Early warning	When the entered value is reached, a message is output.
	Early warning	When the entered value is reached, an error message is output. The process is then stopped as a result.

Backwards totalling counters can be configured via the submenu.

Tap on the **Submenu** button to open further control options.

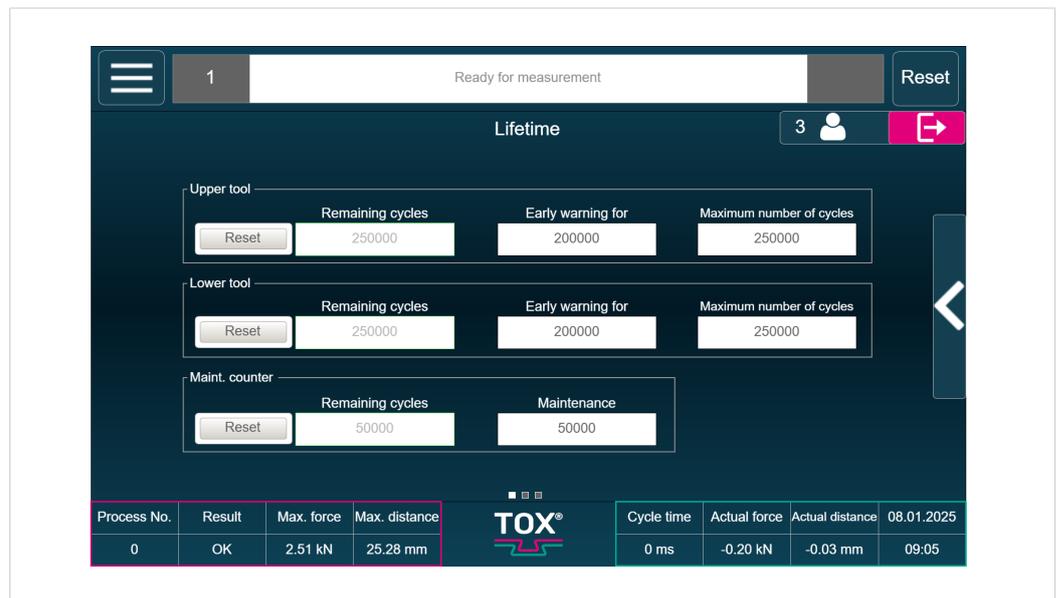


Fig. 48 Lifetime backwards counter menu

In this menu the counters are configured.

	Button	Function
	Early warning	When the entered value is reached, a message is output.
	Remaining cycles	Displays the number of the remaining cycles.
	Early warning for	When the entered value is reached, a message is output.
	Maximum cycle number	Defines the maximum number of process cycles.
	Early warning	When the entered value is reached, an error message is output. The process is then stopped as a result.

### 8.7.2 Customer counter menu

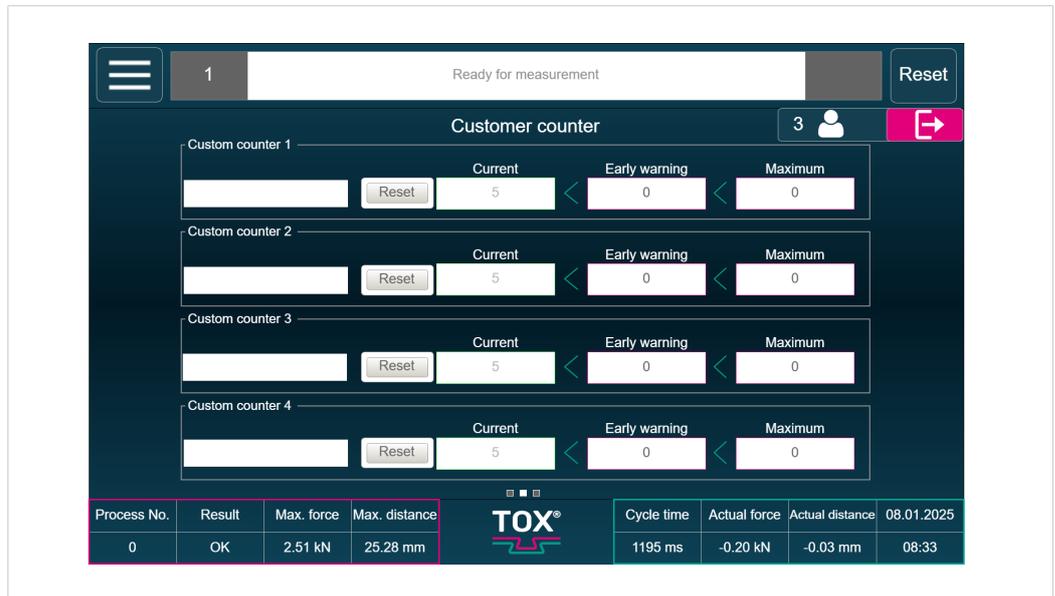


Fig. 49 Customer counter menu

In this menu the counters are configured.

	Button	Function
	Customer counter 1-4	Customer-specific counters can be named.
	Early warning	When the entered value is reached, a message is output.
	Current	Displays the current value.
	Early warning	When the entered value is reached, a message is output.
	Early warning	When the entered value is reached, an error message is output. The process is then stopped as a result.

### 8.7.3 Information memory menu

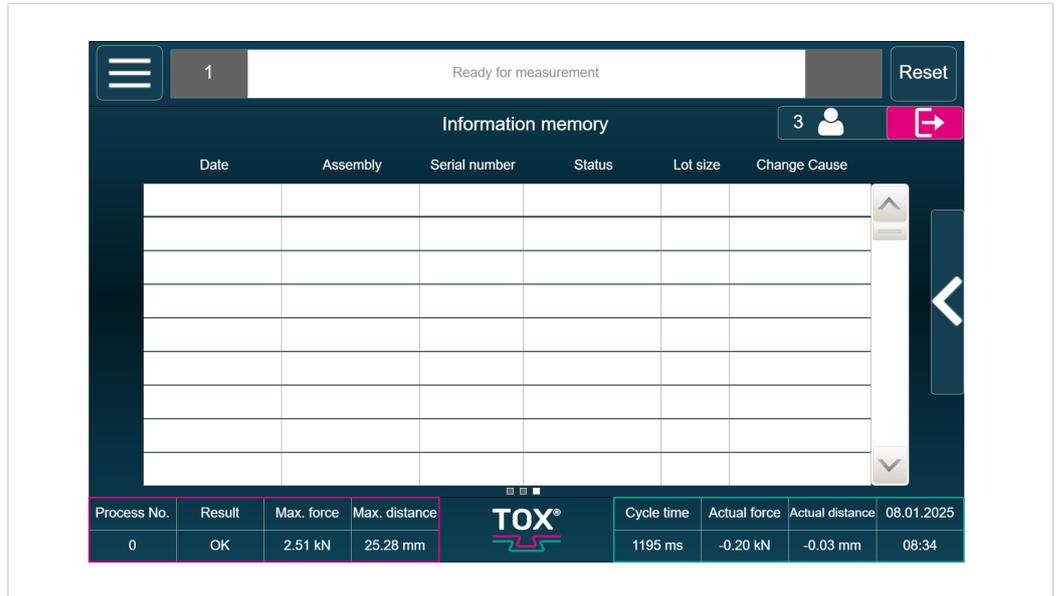


Fig. 50 Information memory menu

In this menu the customer-specific information is created and managed. Information can be exported as CSV file via the submenu. Also new information can be created.

Tap on the **Submenu** button to open further control options.

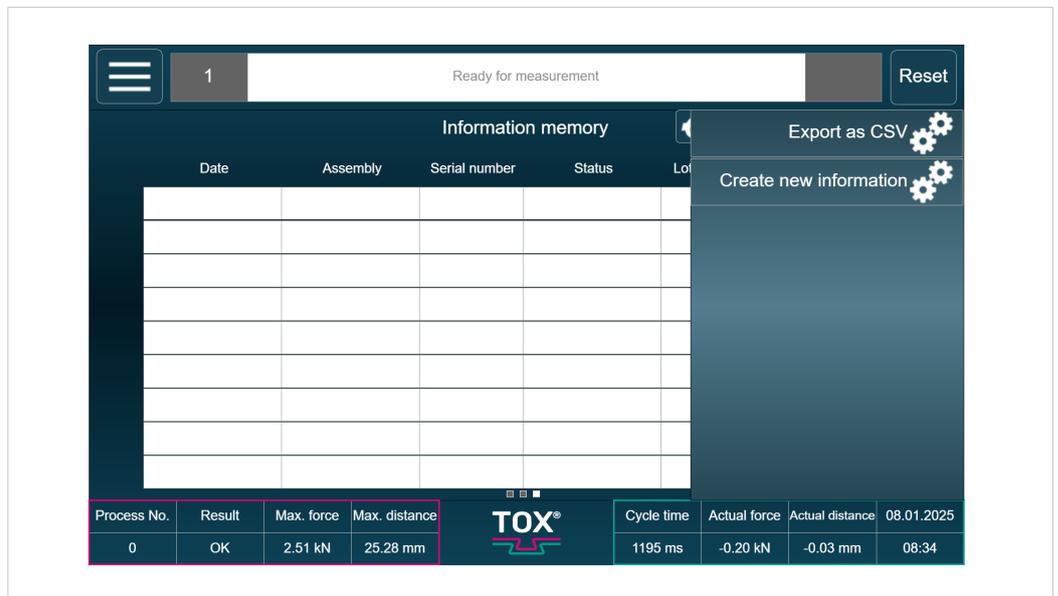


Fig. 51 Information memory submenu

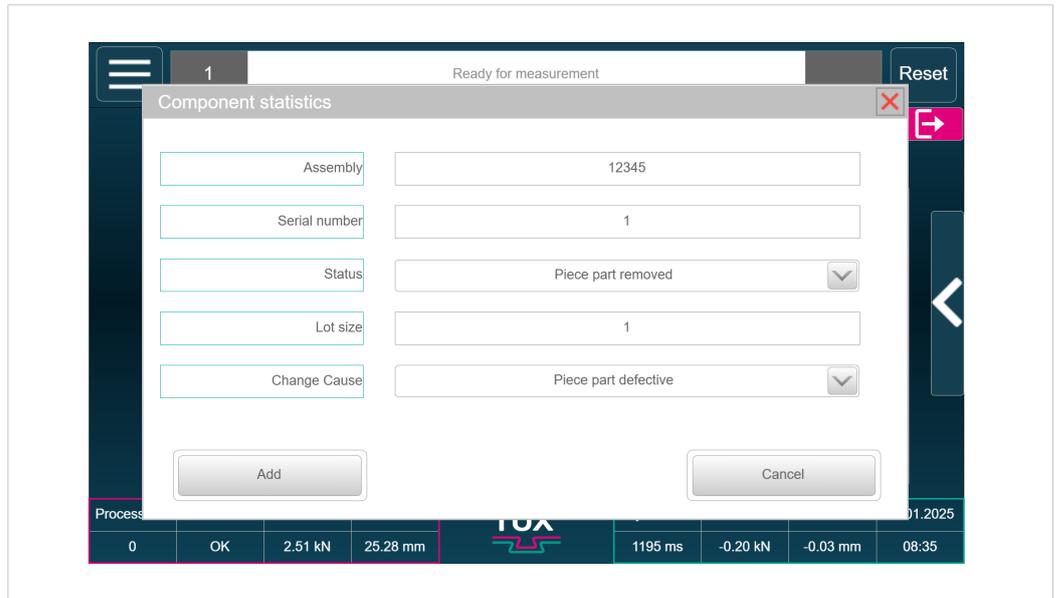


Fig. 52 Create new information in submenu

In this menu new information can be created qualified.

## 8.8 Settings menu

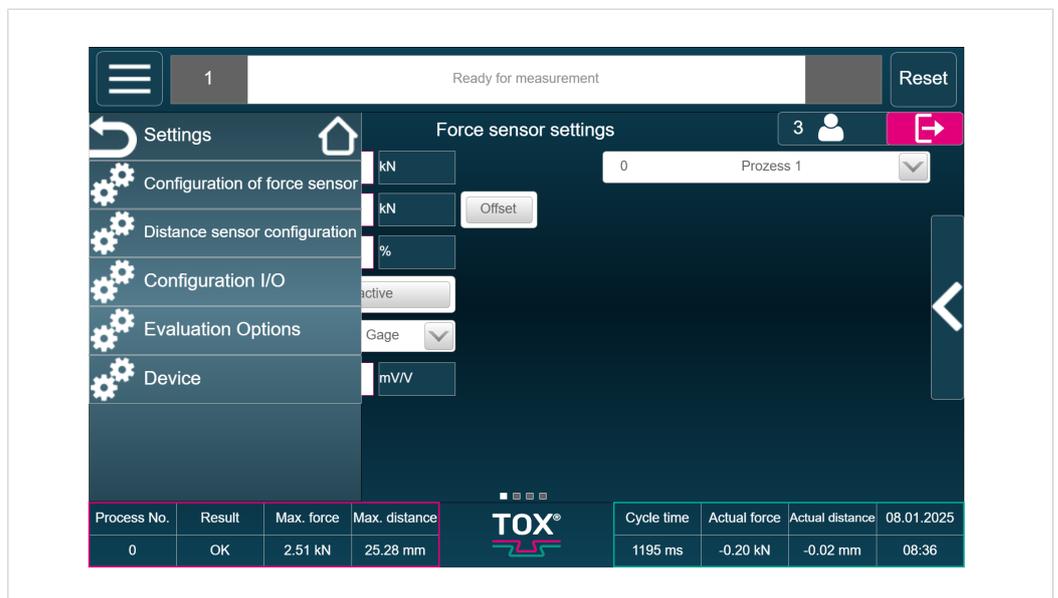


Fig. 53 Settings menu

	Button	Function
	Configuration of force sensor	Opens the setting options of the force sensor.
	Distance sensor configuration	Opens the setting options of the distance sensor.
	Configuration I/O	Opens the setting options for inputs and outputs.

	Button	Function
	Evaluation Options	Opens the setting options of the evaluation options.
	Device	Opens the setting options of the device.

### 8.8.1 Force sensor configuration menu

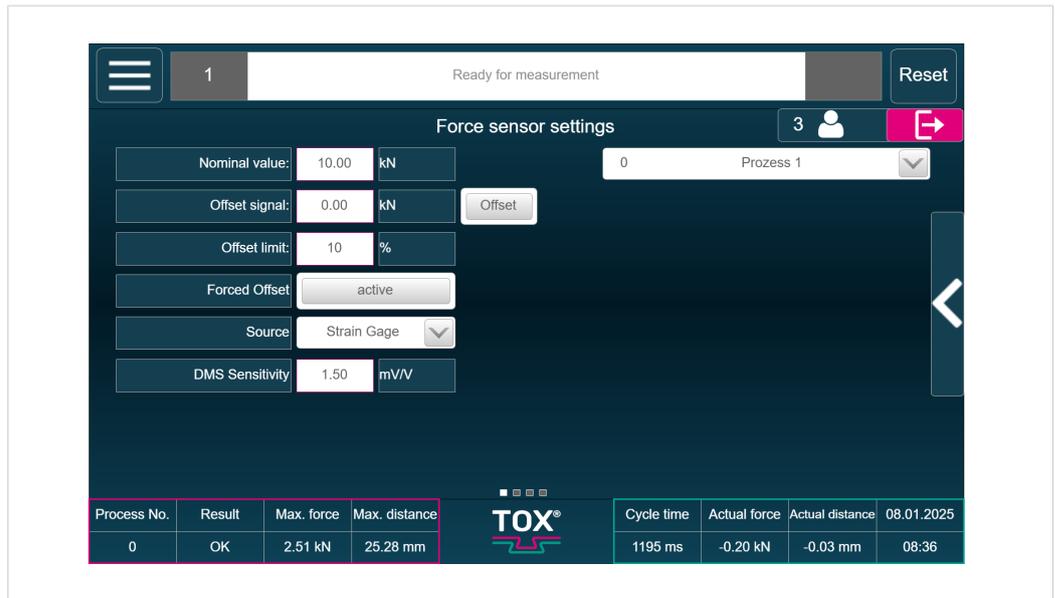


Fig. 54 Force sensor configuration menu

In this menu the parameters of the force sensor are specified for the selected process.

	Button	Function
	Rated voltage	In this line you can set the nominal value for the force sensor used. The nominal value is specified in kN and is reached at the max. measurement signal of the force sensor. For the standard signal 0-10 V, 10 V corresponds to the nominal force.
	Offset value	The offset value adjusts a possible zero point offset of the analog measurement signal of the sensor. An offset adjustment must be carried out: <ul style="list-style-type: none"> <li>Once a day or after approx. 1,000 measurements.</li> <li>When a sensor has been changed.</li> </ul> If the sensor is load-free, the offset value can be set either via the "Offset" button or via the direct value entry.
	Offset limit	Offset limit of 10% means that the "Offset" value must only reach a maximum of 10% of the nominal load. If the offset is higher, an error message appears after the offset adjustment. This, for example, can prevent that an offset is taught when the press is closed.

Button	Function
Forced offset	If the forced offset is activated, an offset adjustment is carried out automatically after the process monitoring system is switched on.
Source	The source can be switched over between standard signal and DMS.
DMS sensitivity	With this parameter the characteristic value of the DMS force sensor is entered. The bridge supply voltage amounts to 5 V.
Setting the force sensor filter	By setting a filter value the higher frequency deviations of the measuring signal can be filtered out.

The submenu can be used to set the factors settings, calibrate the force sensor and make a copy.

Tap on the **Submenu** button to open further control options.

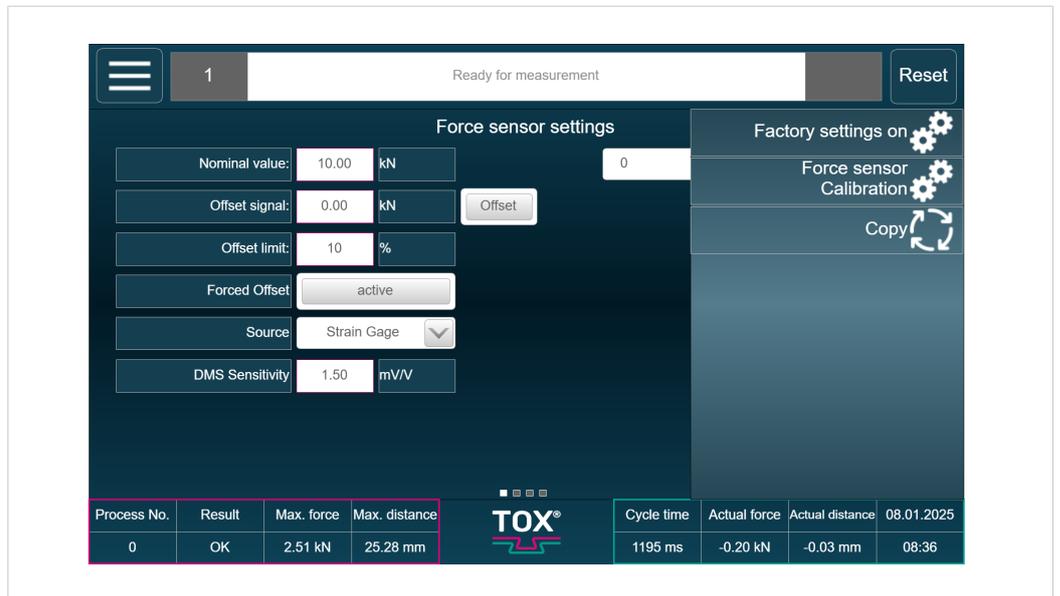


Fig. 55 Force sensor configuration menu

### Calibration of force sensor

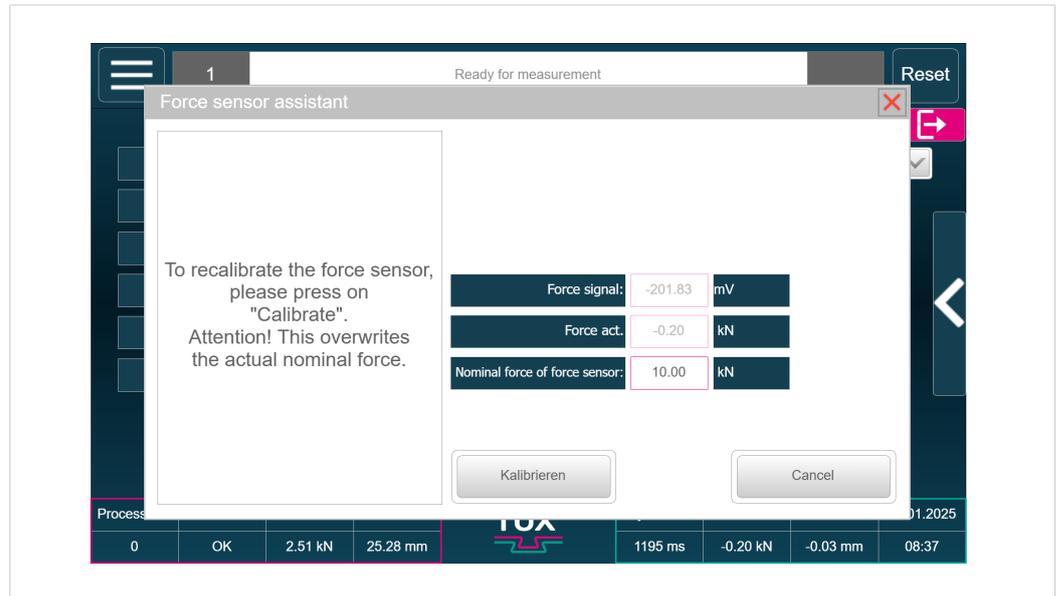


Fig. 56 Calibration of force sensor

With the force sensor calibration the measured electrical signal is converted to the corresponding physical unit with the nominal force sensor and offset values. If the values for nominal force sensor value and offset are not known, they can be determined via the calibration. For this, tap the **Force sensor calibration** button and follow the instructions.

A 2-point calibration is carried out.

- The first point can be the opened press with 0 kN force applied for example.
- The second point, for example, can be the closed press when 2 kN force is applied.

The applied forces must be known for carrying out the calibration, for example, which can be read on a reference sensor.

### 8.8.2 Distance sensor configuration menu

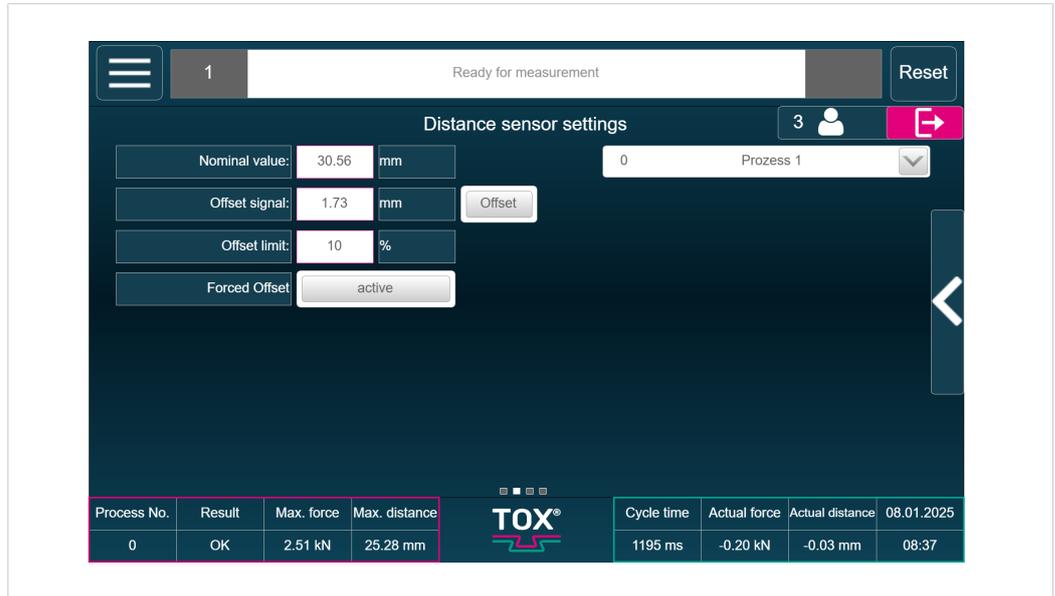


Fig. 57 Distance sensor configuration menu

In this menu the parameters of the distance sensor are specified for the selected process.

	Button	Function
	Rated voltage	In this line you can set the nominal value for the distance sensor used. The nominal value is specified in mm and is reached at the max. measurement signal of the distance sensor. For the standard signal 0-10 V, 10 V corresponds to the nominal distance.
	Offset value	The offset value adjusts a possible zero point offset of the analog measurement signal of the sensor. An offset adjustment must be carried out: <ul style="list-style-type: none"> <li>• Once a day or after approx. 1,000 measurements.</li> <li>• When a sensor has been changed.</li> </ul> If the sensor is load-free, the offset value can be set either via the "Offset" button or via the direct value entry.
	Offset limit	Offset limit of 10% means that the "Offset" value must only reach a maximum of 10% of the nominal load. If the offset is higher, an error message appears after the offset adjustment. This, for example, can prevent that an offset is taught when the press is closed.
	Rated voltage	In this line you can set the nominal value for the distance sensor used. The nominal value is specified in mm and is reached at the max. measurement signal of the distance sensor. For the standard signal 0-10 V, 10 V corresponds to the nominal distance.

The submenu can be used to set the factors settings, calibrate the distance sensor and make a copy.

Tap on the **Submenu** button to open further control options.

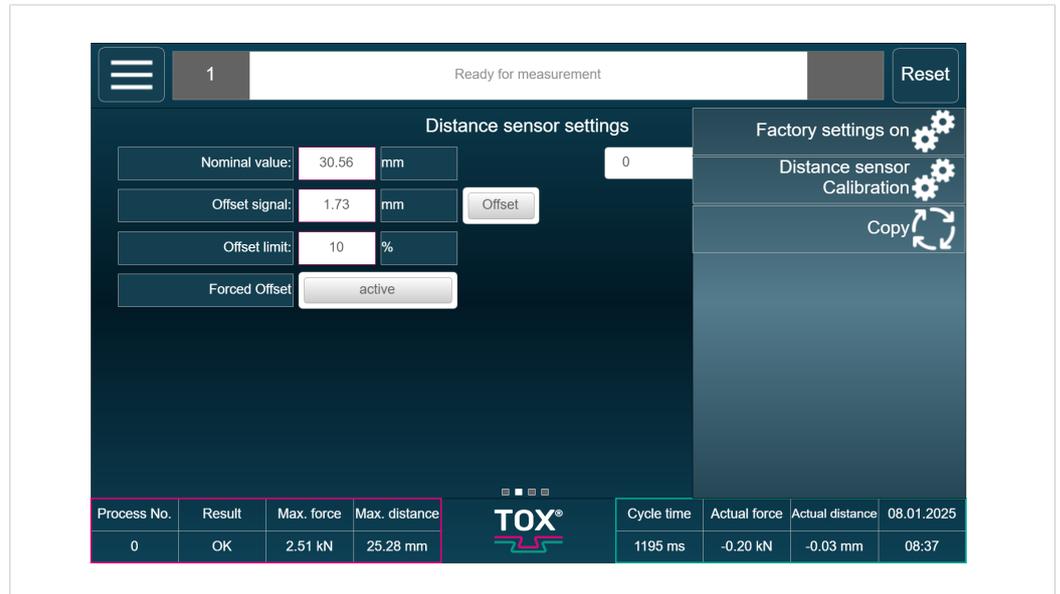


Fig. 58 Distance sensor configuration submenu

### Calibration of distance sensor

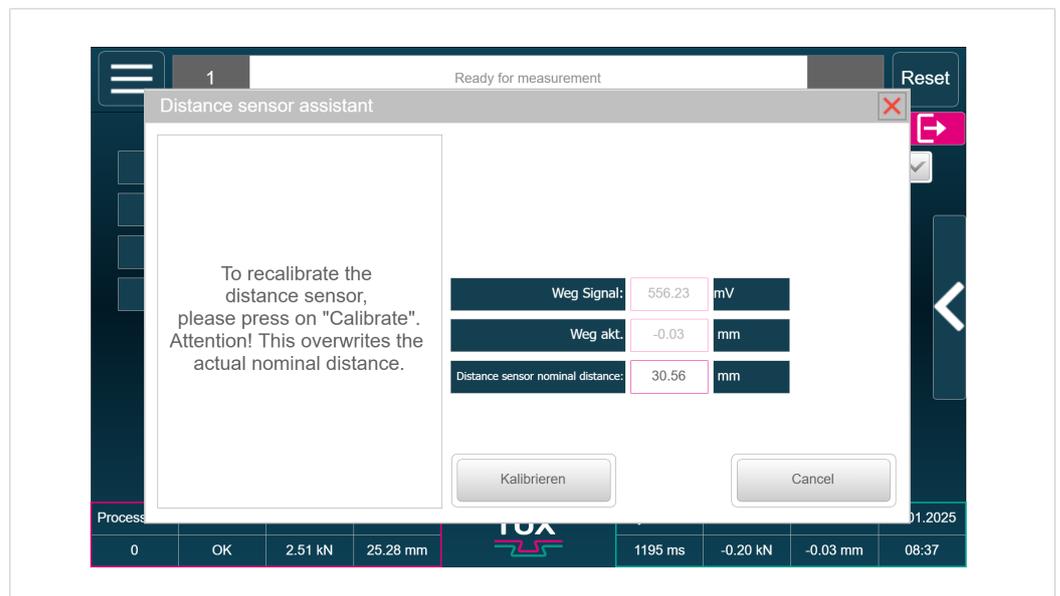


Fig. 59 Calibration of distance sensor

With the distance sensor calibration the measured electrical signal is converted to the corresponding physical unit with the nominal distance sensor and offset values.

If the values for nominal distance sensor value and offset are not known, they can be determined via the calibration. For this, tap the **Distance sensor calibration** button and follow the instructions.

A 2-point calibration is carried out.

- The first point here can be the opened press with 0 mm distance applied for example.
- The second point, for example, can be the closed press when 50 mm distance is applied.

The applied distances must be known for carrying out the calibration, for example, which can be read on a reference material.

### 8.8.3 I/O configuration menu

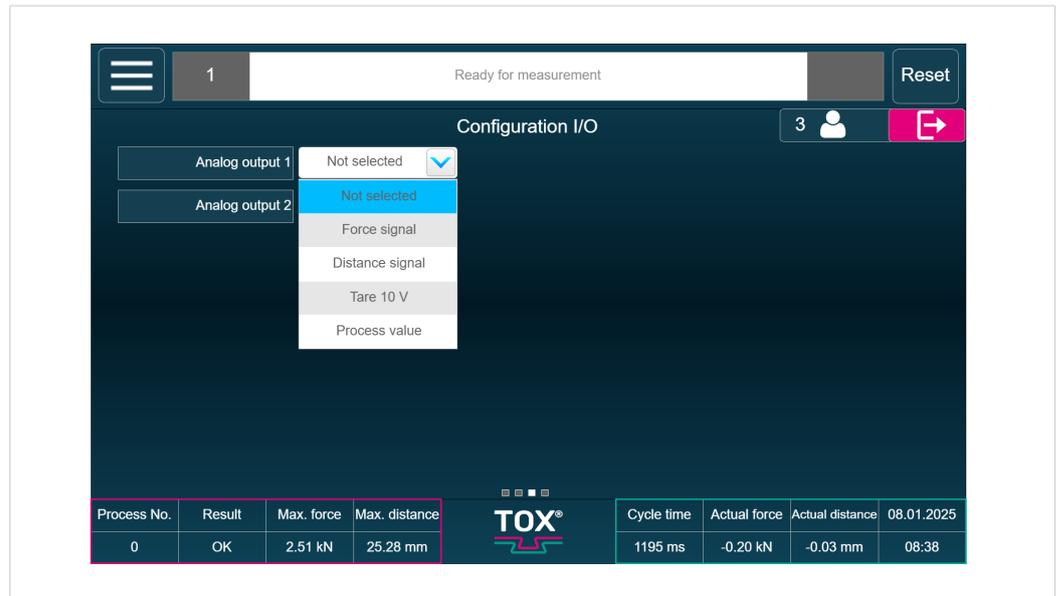


Fig. 60 I/O configuration menu

In this menu the behavior of the two available analog outputs can be defined.

The following options for selection are available:

- Force signal: Outputs the actual value of the force sensor.
- Distance signal: Outputs the actual value of the distance sensor.
- Tare signal: Outputs a tare signal 10 V.
- Process value: Outputs a predefined voltage  
(for setting see [Process parameters menu, Page 49](#))

### 8.8.4 Evaluation options menu

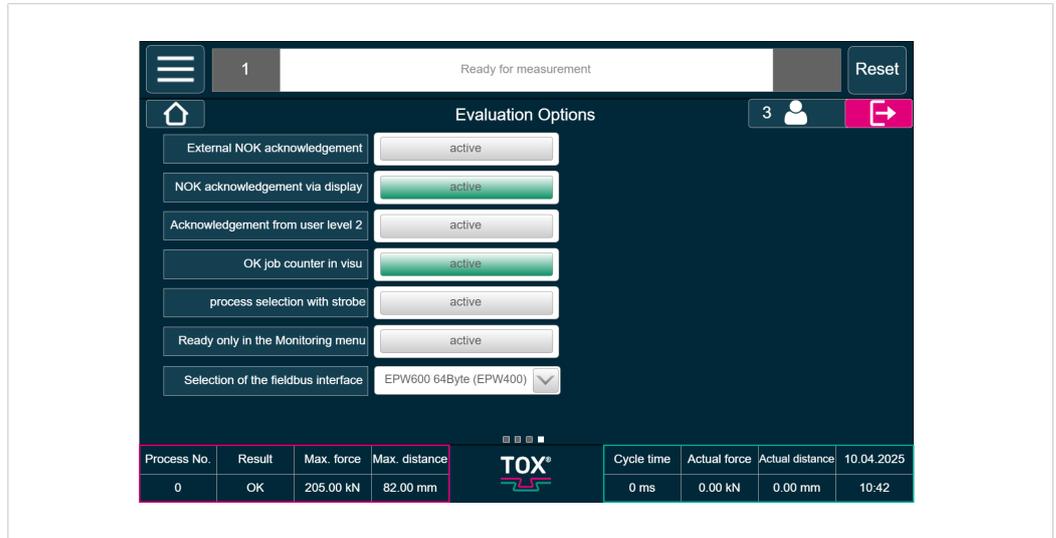


Fig. 61 Evaluation options menu

In this menu different evaluation options can be activated.

- External NOK acknowledgement  
At activation the NOK acknowledgement via the interface is carried out.
- NOK acknowledgement via display  
At activation the NOK acknowledgement is carried out directly on the display.
- Acknowledgement from user level 2  
When NOK acknowledgement via display is activated, it can be additionally set that an acknowledgement first takes place from user level 2 or higher.
- OK order counter in Visu  
An OK order counter can be activated that can be configured in menu <Process>, <Manual process selection>.
- Process selection with strobe  
When activated, a process change takes place via the interface only in connection with the <Strobe> bit.
- Ready for measurement only in monitoring menu  
When activated, process monitoring must be in the start screen so that a new process can be started. No change to a different page is possible during an active measurement.
- Selection of fieldbus interface  
The version of the fieldbus interface can be selected.

### 8.8.5 Device menu

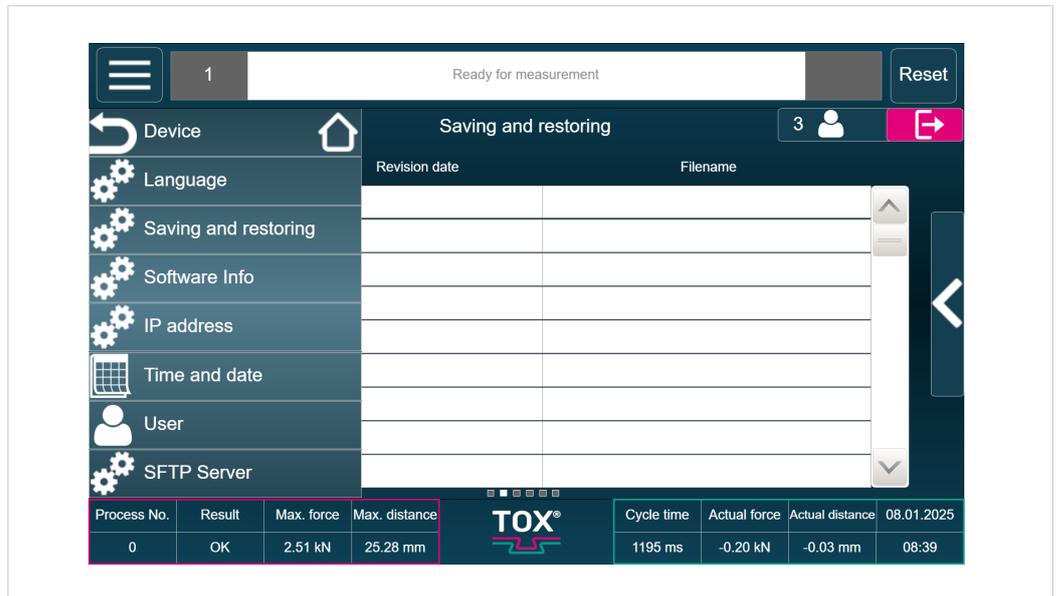


Fig. 62 Device menu

In this menu you can define different device-specific settings.

- Language  
Selects the language of the interface.
- Saving and restoring  
Makes the saving and restoring of the configuration and process date possible. For this **Save data** or **Load backup** can be selected in the submenu.
- Software Info  
Shows information about the software version used. In the submenu a <Software update> or a <System backup> can be triggered. For this, tap on the corresponding button and follow the directions.
- IP address  
Defines the IP address.
- Time and date  
Setting the time and the date
- User  
Defines the <Access mode> and the use of passwords.
- SFTP menu  
Defines the *Secure File Transfer Protocol* via submenu <SFTP final values> and <Backup SFTP parameters>. To do this, open the desired menu and make the settings.

## 9 Troubleshooting

### 9.1 Listing of errors and status messages

Pending error and status messages are displayed in the information and status bar. See [Information and status bar, Page 40](#).

### 9.2 Battery buffer

This data is stored on the battery buffered SRAM and may be lost in case of an empty battery:

- Set language
- Currently selected process
- Counter values
- End value data and sequential number of end values

## Maintenance table

The specified intervals are only approximate values. Depending on the area of application, the actual values may differ from the guide values.

Maintenance cycle	Additional information	
2 years	10.3	<a href="#">Battery change</a>

## **10 Maintenance**

### **10.1 Maintenance and repair**

The recommended time intervals for inspection work and maintenance work must be observed.

The correct and proper repair of the TOX® PRESSOTECHNIK product can only be assured by appropriately trained specialists. The operating company or the personnel in charge of the repair must ensure that the repair personnel are properly trained in the repair of the product.

The repairers themselves are always responsible for the work safety.

## 10.2 Safety during maintenance

The following applies:

- Observe maintenance intervals if present and stipulated.
- Maintenance intervals may vary from the stipulated maintenance intervals.  
The maintenance intervals may have to be verified with the manufacturer if necessary.
- Perform only maintenance work that is described in this manual.
- Inform operating personnel before starting repair work.
- Appoint a supervisor.

### 10.3 Battery change

 TOX® PRESSOTECHNIK recommends a battery change after 2 years at the latest.

- ✓ Device is de-energized.
- ✓ Person is electrostatically discharged.
- ✓ Electrically **non** conductive tool for removing the battery.

1. Remove the cover of the lithium battery
2. Pull the battery out with an insulated tool
3. Install new lithium battery in the correct polarity.
4. Install the cover.

## 11 Repairs

### 11.1 Repair work

No repair work is necessary.

## **12 Disassembly and Disposal**

### **12.1 Safety requirements for disassembly**

→ Have the disassembly carried out by qualified personnel.

### **12.2 Disassembly**

1. Shut down system or component.
2. Disconnect system or component from the supply voltage.
3. Remove all connected sensors, actuators or components.
4. Disassemble system or component.

## 12.3 Disposal



When disposing of packaging, consumables and spare parts, including the machine and its accessories, the relevant national environmental protection regulations must be complied with.



For the environmentally compatible utilization and disposal of its electronic components, please contact the certified disposal company for electronic waste or return it to TOX® PRESSOTECHNIK.

For further information about the take-back and forms see [www.tox.com](http://www.tox.com) in the service sector.

Regarding questions about disposal please contact TOX® PRESSOTECHNIK SE & Co. KG (see [Contact and source of supply, Page 10](#)).

## 13 Appendices



## EU DECLARATION OF CONFORMITY

Original EU declaration of conformity

The manufacturer TOX® PRESSOTECHNIK SE & Co. KG declares herewith that the following devices of the product family

Designation / function	Device for monitoring pressing processes
Product name / module	TOX® EPW 600.0X2.XX.XX TOX® EPW 600.4X2.XX.XX TOX® EPW 600.5X2.XX.XX
Serial number	see type plate
Description	Device for monitoring pressing and joining processes using force and distance recording, available as a compact built-in unit or wall-mounting

complies with all relevant provisions of the following legislation, including any changes in force at the moment of the declaration.

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Applied EU legislation:

2014/30/EU

EMC Directive, OJ L 96 dated 29/3/2014, P. 79–106

2011/65/EU

RoHS Directive, OJ. L 174 dated 1.7.2011, P. 88–110

Reference to the used harmonised standards

DIN EN 61000-6-2:2019-11	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments (IEC 61000-6-2:2016) German version EN IEC 61000-6-2:2019
DIN EN 61000-6-4:2020-09	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments (IEC 61000-6-4:2018) German version EN IEC 61000-6-4:2019
DIN EN IEC 63000:2019-05	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances (IEC 63000:2016); German version EN IEC 63000:2018

Place and date

Weingarten, 29.04.2025

Signature

Information on the signatory

  
\_\_\_\_\_  
ppa Stefan Katzenmaier  
Component and Region Sales Manager



## UK DECLARATION OF CONFORMITY

Original declaration of conformity

The manufacturer TOX® PRESSOTECHNIK SE & Co. KG declares herewith that the following devices of the product family

Designation / function	Device for monitoring pressing processes
Product name / module	TOX® EPW 600.0X2.XX.XX TOX® EPW 600.4X2.XX.XX TOX® EPW 600.5X2.XX.XX
Serial number	see type plate
Description	Device for monitoring pressing and joining processes using force and distance recording, available as a compact built-in unit or wall-mounting

complies with all relevant provisions of the following enactments and their amendments.  
This declaration of conformity is issued under the sole responsibility of the manufacturer.

Applied enactments:

SI 2016/1091	Electromagnetic Compatibility Regulations 2016
SI 2012/3032	The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

Reference to the used harmonised standards

DIN EN 61000-6-2:2019-11	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments (IEC 61000-6-2:2016) German version EN IEC 61000-6-2:2019
DIN EN 61000-6-4:2020-09	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments (IEC 61000-6-4:2018) German version EN IEC 61000-6-4:2019
DIN EN IEC 63000:2019-05	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances (IEC 63000:2016); German version EN IEC 63000:2018

Place and date Weingarten, 29.04.2025

Signature  
Information on the signatory   
ppa Stefan Katzenmaier  
Component and Region Sales Manager

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